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MINING JOURNAL

1891

THE

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WITH WHICH IS INCORPORATED

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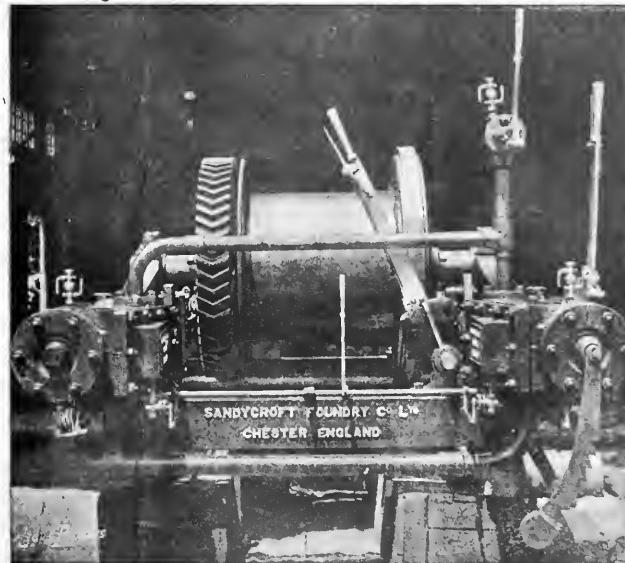
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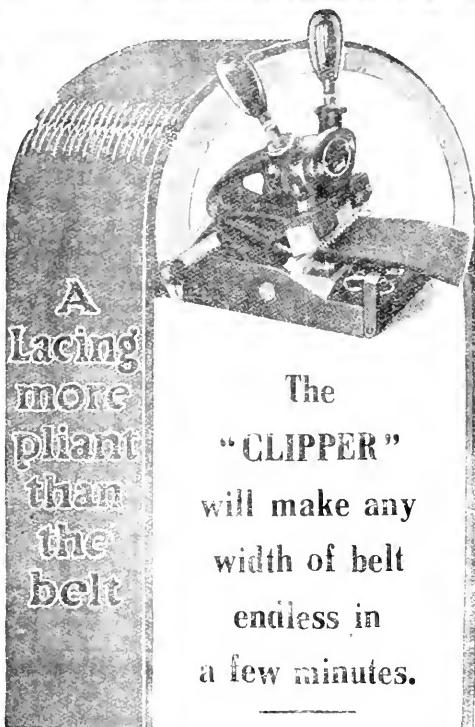
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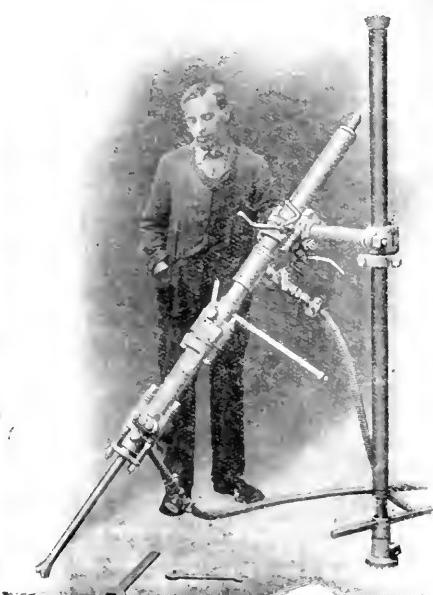
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## CONTENTS.

## PAGE

Notes and News	99
Topics of the Week:	
Native Labour and the Mines	101
The Broad Aspect of the "Life" Question	102
Ore Reserves of the Rand	103
The Position of the Nigel	104
The Year with the Rand Mines	105
The Position and Prospects of Leeuwpoort (African Farms)	106
The Native Wage Bill of the Mines	108
Salaries and Wages in the Mining Industry	109
Improvements in Metallurgical Treatment of Ore	110
Rand Earth Tremors	111
Economic Geology of S.W. Africa	112
Application of Electric Power to Rand Mining Work	113
—V.	114
The Shipping Question and S.A. Industries	115
The Week in the Sharemarket	116
The Week in the Mining Material and Engineering Trades	117
Engineering Notes and News:	
The Kleinfontein Power Association Plant	118
Company Meetings: Tweefontein Collieries; Miners' Phthisis Sanatorium	120

## Notes and News

Editorial notices of the mining industry in the Cape town during the week to give evidence before the Select Committee on the Far East Rand.

**Select Committee.** East Rand. Witnesses are Mr. E. A. Walder, President of the Chamber of Commerce, and Mr. G. Imhoff, Secretary. The Committee has been in session since Monday last, and others will appear before it. It is asked to give the Committee the benefit of its views. Mr. J. Dale Lee and others present have given their names also submitting affidavits to the Committee.

\* \* \* \* \*

As we go to press the Resident Magistrate is signing the civil action brought by Messrs. Blackmore & Sons

**The Moodies Case.** more, tried in the Bloemfontein Court, has

ended up. The question of the right to recover rent for mining ground let to the defendant for farming purposes. We hope to publish the judgment in full next week, but the finding of the Court was as follows.—1st. That the farm Onsebosch, being a 1,000 ha. farm, is an "Mining Title," within the meaning of the Gold Law and is not excluded from the general provisions of Section 67. 2nd. That farming operations in terms of the lease is not an absolute prohibition in view of the provisions of Section 68 of the Gold Law. 3rd. That such a statutory prohibition is a good defence in this action for rent and that plaintiff company must therefore file a notice of action. The case is dismissed with costs.

\* \* \* \* \*

The Transvaal tin, copper and coal returns for March issued by the Department of Mines show

present several extraordinary features. The value of the Transvaal coal export during the month was £37,586 and of Transvaal tin £58,239. The value of the Copper export in the month was £233,629, the combined total value of Cape and Transvaal copper being £271,215, a record for any month since the beginning of 1915. The Transvaal tin export was also a record for any one month since 1914, and more than double the export for February. The value of the March coal output from the Union Estates was also a record, being no less than £229,717, against £206,179 for February, which was the best month for a long time. The Transvaal coal output for the month was valued at £108,374, which is the highest figure since August 1915.

\* \* \* \* \*

The usual rush for options which follows the commencement of activity in any new and special direction in the Transvaal has seen its appearance in the Wakkerstroom district.

Not only from Johannesburg, but from Natal also, the search for oil shale properties is being feverishly stimulated. The consequence of this ardour is that ridiculous prices are said to be offered for anything that comes along in the way of shale, regardless of the bearing these prices may have upon future operations. Pretty much the same thing prevailed just after Mr. Cunningham Craig's visit to the district nearly three years ago, and it has taken more than two years of arduous work to persuade capitalists to carry out such practical work as is now being done on a single property.

\* \* \* \* \*

The problem of estimating in a satisfactory way the mechanical efficiency of crushing does

**Mechanical Efficiency of Crushing.** not appear to have been settled satisfactorily yet in spite of the labours of

Mr. Stadler. From numerous tests which have been made at McGill University during the past two years it is concluded that the fallaciousness of expressing power in terms of "energy units," as proposed by Mr. Stadler in accordance with Kick's law, will be convincingly demonstrated. Rittinger's hypothesis, on the other hand, is supported in so satisfactory a degree as to appear quite dependable. The experiments, it is concluded, while terminating the controversy as to the merits of Kick and Rittinger, will establish a correct basis for calculating mechanical efficiency in crushing.

Since the inauguration of the scheme for small workers which was devised in connection with the **Small Tin Propositions.** alluvial tin deposits upon Vaalbank last year, and the comparatively early failure of the project, we have had numerous letters from people to whom a scheme of the sort appeals strongly. As a matter of fact we are still receiving requests for information. Clearly the idea of opening up likely alluvial tin areas and providing facilities for washing operations on a small scale by individuals with a modest capital, would meet with a wide response from industrious and capable persons who find little or no reward in prospecting or river digging. It seems to be an undertaking that might profitably be established by those possessed of capital who are able to secure sound technical advice. For the benefit of our numerous correspondents we may say that no scheme of the kind is at present in existence in the Transvaal, as far as we are aware. The farm Vaalbank referred to is said to have been taken up by a small syndicate comprising, among others, a mining engineer of some experience in tin mining. We have not been informed with regard to any plans that have been made for the working of the property.

\* \* \* \* \*

The current number of the *South African Medical Record* just to hand prints a paper by B. G.

**Miners' Phthisis and Tuberculosis.** Brock, L.R.C.P. & S. (Edin.), D.P.H., on: "Cow's milk as an agent in the spread of tuberculosis, especially as it affects South Africa." The concluding paragraph is as follows:—

"In conclusion, I desire to direct attention to a clearly indicated desire to confuse the public mind as to the significance of the terms 'miners' phthisis' and 'tuberculosis.' It is of great importance that the general public should be educated to understand that these diseases are quite distinct, and have no relationship to each other, as diseases, the former being a fibroid condition of the lung, resulting from the inhalation of more or less irritating foreign material, such as various types of dust; it is non-contagious, very slow in progress, and rarely the cause of death; it is strictly a personal disease, and only of importance as it affects individuals and their immediate dependents. Deaths said to result from this disease are really due to a super-imposed tuberculosis. Tuberculosis, on the other hand, under favourable conditions, is highly contagious, generally ends fatally, and is of great national importance on account of its rapid increase in South Africa, resulting in the deterioration of large numbers of the population, in addition to those incapacitated by it. This important service our profession can render the country without difficulty."

\* \* \* \* \*

The Board of Trade has appointed a Committee to consider the position of the iron, steel and Engineering Trade engineering industries after the war.

**After the War.** especially in relation to international competition, and to report what

measures, if any, are necessary or desirable, in order to safeguard that position. The following are members of the Committee: Sir Clarence Hyde (chairman), Mr. A. Balfour, Sir Hugh Bell, Bart., Mr. A. J. Hobson, Sir Hallewell Rogers, and Mr. Douglas Vickers. At a meeting held at Manchester, the following resolution was passed: "That in view of the greatly enhanced capacity of the British engineering industry, now engaged on munition work, and of the severe competition to be expected after the war, this meeting of Manchester engineers is of opinion that the organisation of the industry from within should immediately be undertaken." It was also resolved "that this meeting urges the Government to create a Ministry of Commerce, after consultation with representative commercial interests."

\* \* \* \* \*

In the House of Assembly last week, Mr. Sampson asked the Minister of Mines and Industries

**Mines and Employees on Active Service.** whether he is aware that, in spite of the assurances given by General

Smit to the representatives of the men who met him in Cape town some months ago, to the effect that no alterations in the working conditions of the men would take place while the men were away fighting, several mines have posted notices, to take effect next month, which will materially affect adversely those conditions; and,

if so, whether he will make representations to the mine-owners to prevent these changes taking place? The Minister of Mines and Industries replied: I have made enquiries into the matter referred to by the hon. member with reference to the changing condition on mines, and am advised that the Chamber of Mines has no knowledge of the same; that a question arose at the Main Reef mine, which has been settled; at Brakpan a slight change has been made with developers only at the request of the men themselves; at the New Kleinfontein no complaint has been received from the men, and the manager is calling a meeting of those affected for a consultation.

\* \* \* \* \*

At the annual general meeting of the shareholders of the National Bank of South Africa, Ltd.,

**The National Bank.** which is to be held in Pretoria on the 9th June, the board of directors will recommend a dividend at the rate of 6 per cent. per annum, absorbing £168,000. The sum of £173,000 has been provided out of the profits for the year to cover war depreciation of the bank's holding of Government and other gilt-edged securities, thus writing them down to market quotations as at 31st March, with the exception of the last war loan, which has been taken at issue price. Substantial allocations have been made to bank premises and the pensions fund, and full provision has been made for all bad and doubtful debts. The bank's capital and reserve fund amounts to £3,313,000, and fixed and floating deposits £22,000,000.

\* \* \* \* \*

The directors' fourteenth annual report for the year ended 31st December, 1915, on African Farms,

**African Farms** Ltd., to be submitted to the general meeting on 15th June, states, *inter alia*, that farm property account, at £380,975 8s. 8d., is an increase of £77,874 14s. 7d., owing to the cost of 52 farms purchased from the Witwatersrand Land & Exploration Company, Ltd., and two other farms (Avontuur and Knoppeskraal), less the sale of the surface rights of the farms Frischgewaagd, Kalkfontein, Lusthof, Mooifontein, and portion of Vlakplaats. A complete list of the 146 farms, with numbers, areas, and situations, is attached to the report, which shows that the company owns 1,461,166 82 acres in freehold; the mineral rights over 34 farms, having an area of 208,131 16 acres; a lease over one farm (with right of purchase), and a divided interest equal to 20,058 31 acres in Swaziland Concession No. 132L. During the year the farms and properties of the Witwatersrand Land and Exploration Company, Ltd. (in liquidation) were purchased by the African Farms, Ltd., and the Witwatersrand Land and Exploration Company, Ltd., was placed in voluntary liquidation. The share investment account now stands at £130,561 18s. 5d., which is a decrease on the previous year of £50,592 14s. 11d. The decrease is owing to writing off the shares in the Witwatersrand Land and Exploration Company, Ltd., which were surrendered for liquidation distribution, and to an amount of £50 from some shareholdings to bring them down to market value. As in previous years, for the information of shareholders, a complete list of the shares owned by the company will be placed upon the table at the annual meeting. The company holds 114,789 shares in the Leeuwpoort (African Farms) Tin Mines, Ltd., capital £275,000, all issued, which owns the whole of the freehold farm Leeuwpoort No. 938, district Rustenburg, the area being 3,970 morgen 536 sq. rods; the said company also owns the mineral rights of the divided portion (1,099 morgen 81 sq. rods) of the farm Rietfontein No. 940, district Rustenburg). The cash assets, consisting of sundry debtors £2,078 10s. 7d., bonds and loans £110,831 3s. 11d., cash £1,616 4s. 10d., amount to £114,555 19s. 1d., and after deducting cash on loan to the company and sundry creditors, amounting to £36,299 1s., there is a credit balance of £78,346 18s. 4d. at 31st December, 1915.

The 10-stamp mill and tin dressing plant at Welgevonden Tin Mine are being carefully maintained to restart work as soon as the time is opportune. The different farming ventures, despite drought, disease and writing off the usual depreciation, only shows a small deficit of £411 12s. 11d.; no credit has been taken for increase of stock, etc. The mining ventures in which the company participates are: Elandshoogte Mine; Three Sisters Gold Mine, Barberton; Florence & George Claims, Barberton; Kidson Claims, Barberton; Zaniphants Lease, Waterberg; Rietvallei Mine.

Washing was resumed at the Blaauwbosch mine on the 22nd ult. It will be remembered that operations ceased in August, 1914. The main cause of this and of the non-resumption of operations earlier was the breaking of the crank-shaft of the engine and the difficulty of getting it repaired. Everything is now in full working order, and hopes are entertained that the satisfactory results of the past will be repeated.

\* \* \* \*

At the last meeting of the Rhodesian Small Workers' Association, a letter from the Rhodesian Chamber of Mines, giving details of a **Unification of Rhodesian Chambers**, proposed scheme for amalgamating the various mining chambers and associations was read. The Chairman said this was not the first time the proposal had been made. In the past, their Association had considered that such a step meant that the identification and individuality of the Association would be lost and its members more or less merged with those who did not on all points always see eye to eye with them. Mr. Hamblin said it would be a mistake to agree to that proposal. One amalgamated society would not meet the objects for which the Small Workers' Association was formed. They had always joined with the Chamber of Mines when it was necessary and had been pleased to work with them, but it would be a mistake to entertain any thought of amalgamation for one moment. The Congress proposed could still be held on the same basis as that of the Agricultural Union, and the journal and technical facilities mentioned would have their hearty support. But it was not necessary to have unification to attain these objects. A message from Mr. J. Mack, a foundation member and vice-president of the Association, who was unable to get through from Golden Valley on account of the state of the roads, was read, stating that he emphatically disagreed with the proposal. Eventually it was agreed that the letter be acknowledged with thanks and the matter left over till the next meeting in order to get the views of other members.

\* \* \* \*

**Commenting on the question of American capital for the Rand,** the *Financial News* says: "Mr. Isaac Lewis may not only have done a great stroke of business for the East

**American Capital for the Rand.** Rand Mining Estates; he may possibly earn the gratitude of the Union Government; for, with anything like promising conditions, the Americans are clearly ready to invest their capital and await results. The terms under which the syndicate has been formed are not available; but, in any case, we understand that Messrs. Lewis and Marks, having their organisation in South Africa, will retain the main control. The suggestion naturally arises that with this new development a market for Kathus may be made in New York. It would seem more than probable that, so far as East Rand Mining Estates and Grootvlei are concerned, dealings will be introduced; but whether the scope would be extended to include shares of other companies over which the American Rand Syndicate have no direct control is another matter. The main thing, naturally, is to secure the capital.

\* \* \* \*

The declaration of a dividend of 1s. 6d. per share, or 7 $\frac{1}{2}$  per cent., by the Wollhuter last week has been welcomed as reflecting the confidence of the board in the future of the mine. The increase of working costs, owing to the war, has prevented this property from reaping the full and due reward of careful management, but shareholders have no reason to grumble at an increased distribution in the face of all the difficulties of the times. Doubtless the directors would not have raised the rate, did they not hope to maintain it, and purchasers of the shares at recent prices may therefore look for a return of nearly thirty per cent. on their money. The life question, of course, qualifies this return, but, by all accounts, the official estimate, which must necessarily be on the conservative side, may be exceeded.

## TOPICS OF THE WEEK.

### NATIVE LABOUR AND THE MINES.

The appearance in the *Journal of the Gold Miners of the Rand Mines, Ltd.*, issued this week, of a statement of fact for the first time in the history of the industry that the use of native labour has to be reported marks the passing of yet another objection to the further development of the Far East Rand. Indeed, the native labour position, as shown by the speech of Mr. Wallers from the Chamber of W.N.L.A. meet (2), a report of which appears in our *issue*—was never better, and gives every reason for satisfaction. Mr. Wallers showed that the actual number of natives employed by 50 gold mines of the Transvaal during 1915 averaged 205,291, which was 20,007 higher than the average for 1914, and was the highest number employed during the year in the history of the gold mines, the next highest being for the year 1912, when an average of 201,489 natives were employed. At the end of the year the natives employed by members of the Association amounted to no less than 93.7 per cent. of the total requirements of members as shown by their complements, which now approximated very closely to the actual requirements, a revision of complements resulting in a considerable reduction in the total complement of members having taken place during the year. "There is no doubt," he continued, "that this unique position in regard to native labour has enabled the mining industry to meet and overcome, to the extent it has, the difficulties that have arisen through the war. The total number of natives obtained by the Association and its members during 1915 amounted to 252,650, being an increase of 38,821 over the number received in 1914. The steady increase in the number of natives who come to the Rand on their own account and offer their services to the industry continues to be a most satisfactory feature, and the total number of 'voluntary' natives (excluding boys re-engaging on the Rand) amounted to 49,578 in 1915, as compared with 12,030 in 1914. As regards the health conditions of the natives, the death rate continues highly satisfactory as compared with the figures in previous years." So satisfactory, indeed, had the year been from a native recruiting point of view that the substantial surplus of revenue was being distributed to members as a refund on the capitation fees paid by them during the year. The refund was at the rate of 31 $\frac{1}{2}$  per cent. on these capitation fees. As we show in another part of this issue, the increase in the native labour supply has not yet been attended by any extraordinary growth in the ore reserves of the mines, though that increase was obviously responsible for the expansion of the tonnage crushed by the mines last year. The more ample supply of native labour, it appears, is being used to a considerable extent in hand-shifting. Incidentally, attention may be called to the fact that the native wages paid out by the gold industry in the Transvaal last year amounted to no less than £6,002,353, and the sum is significant of the improved economic condition of the South African native. It will be remembered that in his valedictory address as President of the Chamber of Mines, Mr. W. H. Dawe devoted an unusual amount of attention to this important subject. In dealing with the fact that the industry was in the unusual position of having all the native labour that it could employ, Mr. Dawe showed that there were several reasons for that state of affairs, and probably the chief one was that although the diamond mines had started a limited amount of work, they were employing only a very small proportion of the number of natives which they would require in normal times. The drought experienced in all parts of the country had also had a material effect upon the labour supply. "In addition to these causes," said Mr. Dawe, "there probably are others which are not so obvious, but which are more lasting and far-reaching. I have discussed the question with Mr. H. M. Taberer, who is undoubtedly well qualified to form an opinion in regard to the changes which are slowly taking place amongst the native population. It is pointed out that whereas from 10 to 20 years ago the majority of natives were able to exist upon the agricultural products of the land they occupied and the stock they possessed, very important variations have taken place, which have been brought about in the first place by

poor crops reaped, ravages by disease amongst stock, and overcrowing of the land, due to the increase in population. These causes in the first instance made it necessary for the natives to seek work, and once having worked in a regular manner they became subject to other influences. They began to realise that whilst at work they were well fed and provided for, and had the advantages of medical and surgical treatment. These alterations in their method of living being far in advance of anything they had been used to at home, they quickly became accustomed to them, and objected to revert to their old style of life. Many articles of food, clothing, agricultural implements, etc., which in the native kraals were considered luxuries ten years ago are now regarded as necessities; and in some parts of the native territories a gradual improvement in the structure of the living quarters may be observed, whilst articles of furniture are freely purchased by those who have received any education, or have lived amongst Europeans. It is also noticeable that natives display an earnest desire to educate themselves, and their expenditure in this respect is steadily increasing. From these remarks it will be gathered that the economic condition of the native at his home constitutes the greatest incentive to him to leave his family and proceed to industrial centres in search of work. In the opinion of Mr. Taberer this fact, more than any other, accounts for the plentiful supply of native labour on the gold mines to-day, and leads to the conclusion that the native will become, under normal conditions, an ever increasing and reliable asset in the labour market." It is plain, therefore, that the future will see little falling off in the native labour supply, more especially if the growing wants of the native be encouraged by education and example. It is noteworthy that the improved native labour outlook is not confined to the Union. The annual report of the Rhodesian Native Labour Bureau, issued last week, shows that there was again surplus supply of labour available in the territory served by that organisation. New development schemes, therefore, whether of mines on the Far East Rand or in Rhodesia can calculate upon a better labour factor than ever before in the industrial history of this country.

### THE LARGER ASPECT OF THE "MINE LIFE" QUESTION.

It is always difficult to estimate the actual life of a Rand gold mine for the simple reason that there are so many odd and unexpected sources of supply underground when one sets about looking for them in a resolute sort of way, that crushing may be prolonged indefinitely beyond the time when, according to the estimates of the Government Mining Engineer and the figures of the consulting engineer's staff, a producing concern should be as dead as a door nail. At the same time the end of every mine, sooner or later, is inevitable, and those interested cannot afford to rely upon what is not actually visible. Among the arguments put forward by responsible people in favour of hastening the opening up of the undeveloped areas of the Far East Rand is the matter of urgency in view of the diminishing prospects of the mines which are now producing. Judging from the operations of the Government Mining Areas (Modderfontein), Ltd., it may be taken for granted that at least five years are required in order to put a mine into producing order in that neighbourhood, and it is to be remembered that there was very little inducement to the Barnato group to hasten slowly, as the phrase goes, and every reason why they should push things on as quickly as possible. In other cases there might not always exist the same degree or kind of stimulus. Financiers have not been greatly moved by the appeals of the Government during the past few years in the matter of these distant areas, and it is quite clear that they are not going to be rushed into business by anyone else. At the same time there is the possibility, unless something is done without undue delay, that the production of the Rand, and with it the revenue of the Government and the living of the people will be lessened to a marked degree. In discussing the question of the life of the mine at the annual meeting of the New Unified Main Reef last year, the Chairman, Mr. J. Munro, observed that the "official" life

of the mine was still five years from the beginning of 1915, but he ventured to predict that the Unified would be paying dividends for many years after that period had elapsed. This statement will possibly be confirmed by future events, but it is too indefinite to be used as a support for any *laissez faire* policy on the part of the Government, and Mr. Munro would doubtless be the first to say so if his opinion were asked upon the subject. The future of the New Unified, in a word, offers an excellent sporting chance to the speculator, but is not substantial enough as a foundation for national economies. The point that the Government and the people have to bear in mind is that this mine yielded £164,000 worth of gold, approximately, last year, of which £106,076 were spent on the property and of which, say, £5,000 has been already handed to the Treasury on account of profits tax alone, and that before the next important mine on the Far East Rand is doing anything worth talking about in the way of production, the gold output, wages bill, and profits tax may have dwindled to an inconsiderable amount. On the other hand they may not, but as has already been remarked, one must rely upon actual figures rather than possibilities in a matter of this sort. There are some other mines whose demise at no distant date has also been predicted in figures that claim due respect, although there may have been prepared with the prime object of dealing advantageously with the Revenue Department. There are the City and Suburban, for instance, and the New Heriot with a combined output of about £80,000 per month, and a working cost disbursement of some £44,000 for the same period. Then there are the Ginsberg, Glencairn, and New Primrose, old outcrop mines which have had their day, but which yielded gold worth well over £600,000 last year and paid out more than £470,000 in working expenses. Similarly, there are the Durban Roodepoort producing gold to the value of say £170,000 per annum; the Robinson with a yearly output of more than half a million sterling, and a disbursement of nearly half a million; the Village Main producing at the rate of £130,000 a year, and the May Consolidated at the rate of £130,000. Taking this group of mines, representing a yield of, say, at the rate of over £3,000,000 per annum, and a local expenditure of considerably more than £2,000,000, to say nothing of contributions under the heading of profits tax and other payments to the State, it becomes obvious that the fact of their final dissolution which is either now in progress or will be within a comparatively brief period, is a circumstance that cannot be too strongly kept in the view of the Government. Official figures, which must be taken as a little exaggerated on the diminishing scale, or, as directors express it, conservative, and therefore may be regarded as the minimum statement of the case, allow something like seven years at the outside as the limit of existence for the longest lived of all these undertakings. How much is likely to be done in the way of new production in the Far East Rand during this brief span of years? By that time, also, marked signs of decrepitude are due to appear, by all reliable accounts, in several other ventures which are now in the enjoyment of full vigour. It need scarcely be wondered at, therefore, that the *South African Mining Journal* has emphasised the urgent necessity of hastening the development of the country beyond Brakpan.

Safety work has now won a firm hold on the intelligent managements of mines. The main feature—**"Safety First."** has been the effort to arouse the interest and co-operation of the miners themselves. This has been done at the Treadwell group of mines, for example, by organising a committee of fifteen, eight of whom are appointed by the labour union and seven by the mine management. This committee is divided into five sub-committees, covering as many mine departments, so that when an accident occurs the fact is reported to the foreman, mine superintendent and the sub-committee of that department. These make a prompt investigation and deliver a written report on the causes and consequences of the accident to the main committee of safety. In making reports, it is understood that the facts and comments shall be stated honestly and fearlessly, as thus only is it possible to secure evidence of value for future emergencies.

## ORE RESERVES OF THE RAND.

**Official Figures from Annual Reports Over 90,000,000 Tons in Sight—Big Milling Policy and Development—No Striking Advance on Previous Year.**

The accompanying table gives a summary of the tonnage and values of the vast ore reserves of the Rand as obtained from the annual reports of the various companies referred to. In the majority of cases the figures are brought up to the end of 1915, in a few others they represent the position which existed at the end of financial years terminating on June 30th or July 31st last, respectively. Inasmuch as the labour supply was exceptionally abundant last year, it may be taken for granted that the actual position, if these had declared reserve returns at the end of December, would have shown a material improvement on the total recorded for the twelve months. It may be explained that the reserve statements which appear upon our list include, generally, all the ore which may be considered as developed sufficiently for valuation purposes, although a large portion comprising pillars and packs is not available for immediate use. Some are only partially developed, as indicated by a distinguishing letter. In nearly every instance the quantity and values quoted have been calculated over a stope width, so that the tonnage is subject to a reduction on sorting out waste, and a corresponding increase in value as a result of the practically barren material which is eliminated. Inasmuch as many of the reports have only been received within the last few days, we are unable to make an analysis of them for comparative or other purposes. It may be said, however, that at a first glance the impression formed is that there has been little substantial addition to the ore reserves of the previous year. In the face of the plethora of labour this is scarcely what would have been expected, but it must be remembered that a large proportion of the native workers were used in hand-drilling operations in which machines were temporarily displaced, and apparently most of them were engaged in providing additional ore for the mills. The quantity milled in 1915 was 28,314,539 tons, compared with 25,701,954 tons in 1914, and 25,628,432 tons in 1913. This great increment in the tonnage milled would, in the circumstances, account for the apparent limitation of development operations. Apart from this there have been notable diminutions in the reserves of a few companies which have had a material effect upon the general position, and which have not been balanced by individual advances of an important kind in the case of some other concerns.

Producing Mines,	Payable Reserves. Tons.	Value Dwts.
Meyer and Charlton ...	485,246 .....	12·56
	*46,566 .....	19·87
City Deep ...	2,976,800 .....	9·5
City and Suburban ...	637,400 .....	9·0
Modder B. ...	2,790,740 .....	8·75
Van Ryn Deep ...	2,014,108 .....	8·4
Modder Deep ...	2,670,000 .....	8·3
Ferreira Deep ...	1,851,100 .....	8·3
New Modder ...	6,010,800 .....	8·15
New Heriot ...	536,680 .....	8·0
Brakpan ...	3,017,000 .....	7·86
Geduld ...	2,100,000 .....	7·7
Consolidated Main Reef ...	855,600 .....	7·53
Randfontein Central ...	4,419,324 .....	7·4
Government Areas ...	3,665,000 .....	6·9
Witwatersrand ...	1,480,423 .....	6·83
Princess Estate ...	488,000 .....	6·7
Village Deep ...	2,031,600 .....	6·6
Durban Roodepoort Deep ...	1,290,000 .....	6·5
Consolidated Langlaagte ...	2,248,656 .....	6·5
East Rand Proprietary ...	4,800,000 .....	6·3
Crown Mines ...	9,938,000 .....	6·25
Van Ryn ...	1,953,000 .....	6·2
	*18,000 .....	9·9
Witwatersrand Deep ...	1,673,300 .....	6·2
Geldenhuys Deep ...	1,826,800 .....	6·1
West Rand Consolidated ...	1,888,380 .....	6·1
	*255,793 .....	6·4

Producing Mines.	Payable Reserves. Tons.	Value Dwts.
Bantjes Consolidated	618,000	6·1
Langlaagte Estate	4,161,119	6·08
Wolhuter	1,256,783	5·9
Roodepoort United M.R.	720,309	5·9
	118,414	5·17
Main Reef West	416,280	5·87
Knight Central	406,400	5·8
Nourse Mines	2,952,400	5·7
New Unified ...	399,110	5·7
Ginsberg ...	278,118	5·67
Vogelstruis Estate	294,190	5·6
New Goch ...	668,600	5·51
	780,963	4·68
Aurora West	550,014	5·5
	*88,500	5·7
New Primrose	265,623	5·5
New Kleinfontein	2,816,712	5·45
Luipaardsvlei Estate	702,123	5·3
	29,637	5·0
	30,600	5·2
Rose Deep	3,605,300	5·2
Simmer and Jack	2,155,000	5·2
Jupiter	1,217,000	4·6
	*161,000	4·25
Simmer Deep ...	1,585,000	4·4
Glencraim ...	117,430	4·4
Knights Deep ...	2,627,000	4·25
West Rand Central	137,573	4·2
	69,379	unvalued.
May Consolidated ...	No measurable reserves.	
Robinson ...	983,300	payable.
Durban Roodepoort	326,526	payable

Total for Rand producing Mines ... ... ... 91,509,869

Outside Producing Mine.		
Nigel ... ...	122,731	6·5
Non-Producing Mines		
Springs ...	1,125,000	10·4

\* Partially developed.

The figures given above may be segregated as follows:—		Tons.
Over	36·1s.	6,954,752
Between	34·0s. and 36·1s.	13,115,688
	31·9s. and 34·0s.	5,972,600
	29·7s. and 31·9s.	4,449,324
	27·6s. and 29·7s.	11,803,679
	25·5s. and 27·6s.	24,094,302
	23·1s. and 23·4s.	9,517,870
	23·4s. and 25·5s.	8,296,387
Under	21·3s.	5,927,171
		90,131,869

A striking feature of this table is the large percentage of ore valued at between 25s. 6d. and 27s. 6d., or, in other words, between 6 dwts. and 6·5 dwts., figures which lie immediately adjacent to 26s. 3d., which was the average Rand recovery for last year. The Village Main Reef and Robinson Deep are not included in the list.

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## THE POSITION OF THE NIGEL.

### A Promising New Ore-Body—Points from Directors' and Manager's Reports.

THE directors of the Nigel, in their report for 1915, state that a dividend of 5 per cent., absorbing £11,155, was paid at June 30, but owing to unsatisfactory development and low grade of ore directors were compelled to pass the dividend at December 31. In the first four months of the year profits averaged £3,659 per month and even for the first six months the average was £2,846, but in August the profit declined to £55, and in September, October, and December a loss was made, November showing a small profit. Immediate cause was exhaustion of payable ore in W. section of the mine earlier than anticipated, a general fall in grade, and great difficulty in obtaining sufficient high-grade ore from other sections of the mine owing to extremely poor results of development during the last two years. In October the manager suggested that milling operations be suspended for about six months in order to push on development in the Marais Nigel ground. The board took expert advice, and it was decided that it would be more economical to continue operations on a reduced scale than to shut down the mill for the period suggested, and this was accordingly done. It was also decided that development by double shifts of what was considered to be a new shute of ore should be vigorously undertaken, the results of which have proved satisfactory. The shute has been proved in the 11th, 14th, and 22nd levels E. of No. 3 shaft, and at the points exposed the reef is of fair thickness and average assay value of 11 dwts. The shute appears to be about 300 ft. wide and is estimated to contain 172,500 tons of ore, which estimate is based on the assumption that shute maintains its width and reef its thickness throughout the length of the shute. Owing to the time required to open up the shute for stoping, it is feared that the monthly losses will continue until next December, when it is expected that profit earning will be

resumed. The scheme for exploitation of upper claims of Marais Nigel ground and other claims further north by means of an incline shaft, which was referred to by the chairman at the last annual meeting, was approved by the board, and some preliminary work was done, but operations were suspended owing to the whole of the compressed air being required in driving for the new shute. It is intended to recommend sinking the shaft as soon as a new compressor, which has just been purchased, has been installed. The provision of a second tube mill has proved a success, the value of residues having dropped considerably.

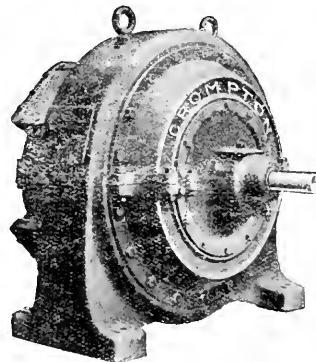
The manager reports:—Total ore hoisted, 136,240 tons, 890 of which were sorted out as waste and 135,350 sent to mill. Of this latter 1,076 tons were derived from pack walls and sweepings. Estimated payable ore reserves at December 31 are 122,731 milling tons, averaging 6·5 dwts. and over, calculated on a 36 in. milling width. “I am abandoning the procedure of carrying forward hundreds of thousands of tons of ore of less than 6 dwts.” The payable ore developed in No. 3 shaft amounted to 94,259 tons, calculated on 36 in. milling width. Profits were maintained at well over £3,000 per month until the end of April, then a drop took place owing to falling off of grade from 7·8 to 7·1 dwts. The grade continued to fall until in December it reached the low figure of 6·5 dwts. Tonnage crushed averaged 11,200 tons per month, with very small fluctuations, except between August and September, when the difference was 1,300 tons. This big drop was due to exhaustion of stopes in No. 7 shaft. The completion of these stopes also caused the screen values to drop, having been high-grade stopes; one of them averaged over 20 dwts. The annual meeting will be held at the company's offices, Bank Street, Pietermaritzburg, on May 25.

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## THE YEAR WITH THE RAND MINES, LIMITED.

### Reduced Returns from Dividends—Some Bright Features—New Interests Acquired.

THE profit earned by the Rand Mines, Ltd., in 1915 amounted to £886,355 11s. 9d. When compared with that for the previous year a decrease of £279,895 4s. 7d. is shown, which is chiefly accounted for by a falling off in the amount received from dividends on shareholdings amounting to £262,986 12s. 9d. Reduced dividends were declared by the Crown Mines, Ltd., Nourse Mines, Ltd., The Village Main Reef G.M. Co., Ltd., and Ferreira Deep, Ltd. A satisfactory increase is shown in the dividends declared by the Modderfontein B. Gold Mines, Ltd., and the City Deep, Ltd. The previous year's receipts included bonus distributions by the Ferreira Deep, Ltd., and Robinson G.M. Co., Ltd. The revenue derived from reservoirs, interest and exchange and sundry revenue shows a decrease of £7,255 18s. 10d., and share realisation account shows a decrease of £10,344 16s. Against these decreases, administration and other expenditure show a reduction of £692 3s. The balance of £339,102 14s. 8d. unappropriated at the commencement of the year, together with the above profit of £886,355 11s. 9d., and £33 11s. 4d. in respect of forfeited dividends, making a total of £1,225,491 17s. 9d., has been dealt with as follows:—Net expenditure on investments, etc., £54,804 15s. 11d.; dividends Nos. 24 and 25—160 per cent., £850,398; balance represented by debentures and Union of South Africa Stock, cash and cash assets, less liabilities, £320,289 1s. 10d. A sum of £7,279 8s. has been written off debentures and Union of South Africa Stock in order to reduce the book value to the market price at the end of the year. The company administers the importation and purchase in bulk of certain mining supplies on behalf of the companies of the Central Mining/Rand Mines group during the period of the war, and, in order to facilitate the allocation and accounting work in connection therewith, the cost of the supplies is in the first place paid by the company. The total amount of the payments outstanding at the end of the year was £48,419 17s. 3d., which, however, has since been recovered from the companies participating. An expenditure of £4,169 8s. was incurred during the year on the maintenance of title (claim licences, etc.) to claims on farms "Elandsfontein" Nos. 6, 11 and 26, and "Driefontein" No. 12, whilst an amount of £7,040 16s. 3d. was expended on the acquisition of a half interest in 862 38 claims on the farm "Vogelstruisbult" No. 36, situate on the Far Eastern Rand, and immediately south of the farm "Daggafontein" No. 25. The claims and water-rights now held are detailed in the balance sheet. No change has taken place in the area of your freehold farm properties during the year, the particulars of which appear in the balance sheet annexed. Two house properties have been disposed of during the year practically at book figures. The remaining properties have been written down to the estimated market values as at the end of the year. The following shares have been purchased during the year:—180 £1 shares in the Jupiter Gold Mining Co., Ltd.; 2,800 10s. shares in the Crown Mines, Ltd.; 5,000 £1 shares in the Modderfontein Deep Levels, Ltd.; 15,000 £1 shares in the Geduld Proprietary Mines, Ltd. The sales were as follows:—1,800 £1 shares in the Modderfontein B. Gold Mines, Ltd.; 650 £1 shares in the New Modderfontein Gold Mining Co., Ltd. The South Deep, Ltd., and Booyens Estate, Ltd., have been placed in voluntary liquidation, and the company's shareholdings will shortly be exchanged for 98,204 fully paid "B" shares of £1 each in the Robinson Deep, Ltd.

#### DIRECTORS' REVIEW.

The report of the directors concludes:—"The results of the operations of the companies in which you are interested have been briefly referred to above, and must be considered satisfactory in view of the general increase in the cost of stores and materials, and the calls made on men for service in Europe and Africa; although the arrangements made with the Imperial Authorities for the disposal of bullion are satisfactory; there have been notable advances in the cost of insurance, transport, and realisation of the gold produced, and it has been necessary for all companies to lay in stocks of stores and materials much in advance of previous years.

A very ready response was given by the employees of the Central Mining/Rand Mines group to the call for volunteers for active service in Europe and Africa. A total of 1,178 men had joined the forces at the end of the year, and allowances have been made, varying from quarter-pay for single men without dependents and half-pay for married men, or single men with dependents. A special war levy of £500,000 was made by the Government on the mining industry, payable by the companies *pro rata* to the tax paid by them on profits. The estimated amount of this additional impost has been provided for in the companies' accounts. Probably for the first time in the history of the Rand the requirements of the mining companies in respect of native labour have been fully met. A plethora, following upon years of shortage, has been the cause of some disorganisation and, in some instances, has had the effect of increasing working costs, but advantage has been taken of this position to push development operations as much as possible and to do other work which can only be carried out when the supply of native labour is in excess of the requirements for essential mining operations. The health and safety of employees still has constant attention, and no efforts have been spared to reduce the rate of mortality to a minimum. The results in this respect still continue satisfactory."

#### LIST OF SHAREHOLDINGS.

The list of shareholdings as detailed in the balance sheet is as follows:—81,444 Bantjes Consolidated Mines, Ltd., shares of £1; 5,222 Booyens Estate, Ltd. (in liquidation—see directors' report), shares of £1; 205,437 City Deep, Ltd., shares of £1; 852,877 Crown Mines, Ltd., shares of 10s.; 127,017 Durban Roodepoort Deep, Ltd., shares of £1; 55,198 East Rand Proprietary Mines, Ltd., shares of £1; 393,468 Ferreira Deep, Ltd., shares of £1; 15,000 Geduld Proprietary Mines, Ltd., shares of £1; 282,593 Geldenhuys Deep, Ltd., shares of £1; 142,875 General Estates, Ltd., shares of £1; 125,273 Jupiter G.M. Co., Ltd., shares of £1; 29,282 Main Reef West, Ltd., shares of £1; 62,723 Modderfontein B. Gold Mines, Ltd., shares of £1; 5,000 Modderfontein Deep Levels, Ltd., shares of £1; 38,202 New Modderfontein G.M. Co., Ltd., shares of £4; 391,233 Nourse Mines, Ltd., shares of £1; 5,758 Pretoria Portland Cement Co., Ltd., shares of £1; 29,275 Robinson G.M. Co., Ltd., shares of £5; 269,224 Rose Deep, Ltd., shares of £1; 22,463 South Deep, Ltd. (in liquidation—see directors' report), shares of £1; 45,347 The Village Main Reef G.M. Co., Ltd., shares of £1; 19,520 Turffontein Estate, Ltd., shares of £1; 12,000 Victoria Falls and Transvaal Power Co., Ltd. (6 per cent. cumulative preference shares), shares of £1; 117,340 Village Deep, Ltd., shares of £1; 23,720 Wollhuter Gold Mines, Ltd., shares of £1; and sundry shares to the value of £108 963 17s. 5d.

#### South-West Diamond Fields.

The returns of diamonds found in the various diggings throughout the South-Western Transvaal for the month of March show that the improvement disclosed in the preceding months has been maintained, as the subjoined figures for the past three months will show:—

	Carats.	Value.
January	2,486 <sup>1</sup>	£11,818 7 0
February	3,606 <sup>3</sup>	20,970 10 6
March	4,041	20,632 16 0

Forty-five areas figured in the list of producers, and the largest of these with their output total, were as under:—

	Carats.	Value.
London	940 <sup>1</sup>	£4,780 0 0
Dieveldraai	448 <sup>1</sup>	2,516 16 0
Bloemhof	462 <sup>1</sup>	2,387 14 6
Kafferspan	296 <sup>1</sup>	1,535 16 0
Koppiesvlei	283 <sup>3</sup>	1,482 1 0
Klipkuil	250 <sup>2</sup>	1,126 12 6
Kameelkuil	160 <sup>2</sup>	954 0 0
Eastleigh	105 <sup>2</sup>	633 11 0
Christiana	102	567 17 6

## POSITION AND PROSPECTS OF LEEUWPOORT (AFRICAN FARMS) TIN MINES.

An All Round Improvement—Net Profit for 1915, £16,576—Increased Ore Reserves.

The results of the operations at Leeuwpoort Tin Mines to the end of the year (December 31st, 1915) were as follows:—Mill, 17 stamps (2 Nissen and 15 California) ran 326.71 days; ore milled, 43,292 short tons; duty per stamp per diem, 7.79 short tons; concentrates won, 917 long tons; average grade of concentrates, 63.43 per cent. M.T.; average grade of ore treated (pulp samplings), 2.25 per cent. M.T. In addition to the above-mentioned 917 tons of concentrates produced, there was approximately 29 long tons of 63 per cent. metallic tin grade to be obtained from accumulated partly-treated " middling-product " concentrates in circulation throughout the plant, and awaiting final treatment. The working revenue and expenditure accounts shows a profit for the year ended 31st December, 1915, of £17,929 4s. 7d.; sundry revenue, rents, brought in £881 2s. 5d.; making a total of £18,810 7s.; interest paid and loss on farming absorbed £2,234 0s. 7d.; leaving a net profit for the year of £16,576 6s. 5d. Buildings at £9,546 2s., shows an increase during the year of £683 4s. 10d., which sum was expended on buildings for housing the mine employees, stores, and workshops on the property. Machinery, Plant and Equipment.—The amount of £76,849 7s. 4d. is an increase of £12,700 3s. 9d., and represents the cost of pumps, calcining, re-grinding, and re-concentrating plant. The total of 4,203 feet of development, 857 feet of prospecting and exploratory work, and 1,264 feet of trenching work was accomplished during the year. The details of development are as follows:—(1) Spruit Mine, 915ft.; (2) C.N. South Mine, 174ft.; (3) West Mine, nil; (4) H.G. Mine, 1,804ft.; (5) Nek Mine, 779ft.; (6) Spruit Extension Mine, 365ft.; (7) New Strike, 256ft.; total, 4,293ft. The summary of ore reserves shows a total of 107,160 short tons, containing 2.14 per cent. metallic tin. Water Supply.—The water supply has been quite sufficient for all requirements.

The report of the Consulting Engineer, Mr. D. Wilkinson, is as follows:—The results of the last year's operations are given in detail in your Manager's report, and show an all round improvement on those obtained during 1914. The tons milled were 43,292, as compared with 44,478 during the previous year, but there was an improvement in the value of the headings from 1.69 to 2.25 per cent., or 0.56 per cent. metallic tin. The improvement in the value of the ore milled was the main cause of the increase in the yield from 706 to 917, or an increase of 211 long tons of black tin—practically 30 per cent. above the previous year. This improvement was caused by a larger percentage of the tonnage being mined and a smaller percentage taken from the ore at grass. Thus, while in 1914 16,654 tons or 34.3 per cent. was taken from ore at grass, only 6,677 tons or 13.89 per cent. was taken during 1915. Of the total ore milled, viz., 41,384 tons, 49.07 per cent. was taken from the ore reserves, 10.25 per cent. from sources not included in ore reserves, and 40.68 per cent. from development faces. There is an increase of 14.75 per cent. in the tonnage taken from sources not included in the reserves, and 3.48 per cent. in the tonnage obtained from development faces. There has also been a considerable increase in the development footage accomplished. Excluding shaft sinking, and prospecting on the surface, the development footage in 1914 was 1,861 feet, while in 1915 this figure was increased to 2,432 feet, an increase of 2,432 feet. The sinking of the Spruit and Spruit Extension shafts should be resumed this year. A comparison of the costs indicates that there has been an increase from £1 7s. per ton milled to £1 14s. 2d. The milling and concentrating, drying and bagging and realisation costs account for an increase of £s. 1 23d. per ton milled. This is due chiefly to the increase in the tons of concentrates produced. The increase in the cost of mining and development amounts to 3s. 0.31d. per ton milled, and was caused by the larger tonnage actually mined during the year, the smaller amount taken from grass and the increased charges for development redemption. The actual cost of the production

and sale of 1 ton of metallic tin was £7 13s. less than during 1914. The ore reserves have been carefully re-estimated, and amount to 107,160 tons of an average assay value of 2.14 per cent. metallic tin, thus showing an increase of 17,305 tons and a decrease in average value of 0.26 per cent. metallic tin. The method adopted in estimating these ore reserves differs from that adopted in 1914, and is more in accordance with the actual tonnage that will be stope from the various blocks. The value stated is also more in accordance with the probable screen values anticipated during this year. The occurrence of profitable sections of tin ore is more irregular than that of many other metals, but, as the method adopted is based upon over two years' experience, the tonnage given may be considered reliable. The percentage yield of tin from milling operations during the early portion of the past year was disappointing, owing chiefly to certain defects in the Brunton calciner, but, during the last six months of the year, the percentage was increased to 74.58 per cent., this percentage being based upon the actual headings value obtained by the Elmore sampler and the actual tin recovered. There has been considerable delay in the delivery of the Duplex Merton Furnaces, but it is anticipated that this plant will be running by the middle of this year. I beg to confirm the statement of your manager that the outlook at the mine at the close of the year 1915 was better than at the close of the year 1914.

The manager, Mr. J. Irvine Jameson, in his annual report, has the following, *inter alia*:—The total development and exploratory work accomplished during the year was 5,150ft.; included in this total is 857ft. of prospecting and exploration. Appendix No. 1 (attached) gives full particulars with reference to this work. The average monthly footage for the period was 429 feet. In addition to the above development and prospecting work, 1,264 feet of surface trenching, averaging 5ft. to 6ft. in depth have been sunk. The greatest amount

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of development work has again been done at H.G. Workings—namely, 1,804ft. (equal to 150ft. per month). The total cost of development was £6,786 11s. 9d., equal to £1 11s. 7d. per foot. Main Shafts.—No Main Shaft sinking has been done during the year. The Main Incline at the South Spruit Extension, which had already been sunk to 303ft. at the end of 1914 as a prospecting shaft, has been entirely reconditioned, regraded and timbered and generally equipped to the bottom. Curtailment of Development Work.—The curtailment policy inaugurated on the 15th June, 1914, was continued for the first five months of the year under review, the average footage per month being only 117ft. From June to the end of the year the footage was increased to an average figure of 508. The minimum footage recorded was 86 during March, and the maximum 587 during October. For the above reason the past year's development work must again be regarded as abnormally low. In spite of this fact the ore disclosures have been very satisfactory. Prospecting.—The amount of prospecting work has been limited owing to the same reason (curtailment policy). Nearly the whole of the prospecting work has been carried out in the vicinity of the West Old Workings on the southern slope of the H.G. Kopje, and on the flat ground further south. Several promising occurrences have been located, and are being further exploited. Sufficient work has not yet been done to express an opinion as to their ultimate value as ore producers. Ore Reserves.—The estimate of the mining tons of ore developed, exposed and at grass at 31st December, 1914, was:—89,855 short tons of average 2.4 per cent. metallic tin value. At 31st December, 1915, the figures in mining tons are as follows:—Total ore exposed—developed : 103,655 short tons; value metallic tin, 2.17 per cent. Total ore at grass : 3,475 short tons; value metallic tin, 1.10 per cent.; total, 107,160 short tons, average value metallic tin 2.11 per cent. It will be noticed that there is an increase of 17,305 short mining tons in the total reserves, accompanied by a decrease of 0.26 per cent. metallic tin in average value when compared with last year's figures. The ore reserves have been recalculated by methods based on the experience gained by stoping and milling during the past 22 years. All reserve blocks above the 1st level at the Spruit Workings have been eliminated; as it is considered that probably these reserves, although high grade, will remain intact for some years. The estimated low grade ore at the Quarries Working (5,397 tons) has also been eliminated in estimating the present figures. Only a small proportion (6,677 tons) of ore was obtained from dumps (ore at grass), and nearly all of this at the beginning of the year whilst the curtailment policy was being carried out. The two chief sources of ore milled were again H.G. and the South Spruit Extensions Workings—27,619 short tons—66.7 per cent. of the total ore milled. At the very irregular occurrence—H.G. Workings—a modified shrinkage and caving system has been adopted for stoping the ore, which up to the present has been most successful. The tonnage extracted from H.G. Workings alone since the commencement of milling operations is 57,789. The total waste sorted during the year increased to 9.9 per cent. of the ore sent to the Crusher Station. Comparing the above result with the previous year's work, it will be noticed that with an increased grade of ore milled and a slight reduction in the time run and tonnage milled, there is a substantial increase of 211 long tons of Concentrates produced during the year under review. It is expected that during the present year (1916) it will be possible to increase the screen aperture of the battery, and thereby increase the average duty per stamp per diem. This will only be practicable when the new calciners and regrinding plant are in commission. The average grade of ore milled compared with the previous year showed an increase of 0.56 per cent. metallic tin, owing to the large proportion of the ore milled coming from underground instead of low grade ore at grass. Working Costs.—The following figures give the cost per ton milled for the year, including realization charges and Mine Development Redemption:—Mining, £11,763 15s. 1d., or 5s. 5.209d. per ton milled; transport of ore, £1,505 13s. 1d., or 8.347d. per ton milled; sorting and crushing, £1,566 7s. 9d., or 8.684d. per ton milled; milling and concentrating, £22,916 6s. 6d., or 10s. 7.209d. per ton milled; drying and bagging, £1,674 14s. 5d., or 9.284d. per ton milled. General Charges: Mine, £7,010 8s. 9d., or 3s. 2.864d. per ton milled; Head and London Offices, £2,280 8s. 6d., or 1s. 0.642d. per ton milled; Realisation Charges, £14,563 15s. 6d., or 6s. 8.738d. per ton milled; total, £63,310 9s. 7d., or £1 9s. 2.977d. per ton milled; Mine Development Redemption, £10,659 18s., or 4s. 11.096d. per ton milled; total Working Expenses, £73,970 7s. 7d., or £1 11s. 2.073d. per ton milled; profit, £18,200 3s. 5d., or 8s. 4.897d.; total revenue, £92,170 11s. or £2 2s. 6.970d. per ton milled. Included in the total working costs is an amount of £10,659 18s. for mine development redemption. The actual amount spent on development work was £6,786 11s. 9d., or including prospecting and shaft sinking £8,707 2s. 3d., leaving a credit balance of £1,952 15s. 9d. to this account. Last year (1914) the credit balance was £1,091 19s. 10d. Also included in the working costs is the active service allowance made to the dependants of those serving at the Front. At the 31st December, 1915, in addition to the marketable concentrates produced at that date, there were approximately 29 long tons of, say, 63 per cent. metallic tin grade remaining in partly treated middling product concentrate stacked, and in circulation throughout the plant, requiring final treatment. The stacked products will be treated as soon as the additional plant is in commission. Additional Calcining, Re-Grinding and Re-Concentrating Plant.—Owing indirectly to the war, there has been a very considerable delay in the erection of this plant. Part of the iron work for the Duplex Merton furnaces ordered last February (1915) has not yet been received on the property—it is expected to arrive about the beginning of next month (March). The brief work on the calciners has been pushed ahead as far as possible. The remainder of the plant is nearing completion. The six Isbell True Vanners, four Buss Tables, Hardinge Conical Pebble Mill, two Huntington Mills, two Dipper Wheels, Classifiers, Dewaterers have all been erected. The floors and drains have been completed and the necessary pumps installed, and electrical

connection with the Power Plant made. Active work on a limited scale was started on the 7th April, 1915, and but for the unavoidable delay mentioned, the plant would have been in commission before the end of the year 1915. The re-grinding and re-concentrating portion of the plant will be started up before the calciners are completed. The two Duplex Merton Calciners, when in commission, will it is hoped completely meet the roasting problem. During the year the existing Banton Calciner has been working under a considerable overload. Two breakdowns to the calciner occurred, which caused serious inconvenience to the tin-dressing work at the time. It was also found essential to build and add a dust chamber to the furnace at the beginning of the year in order to prevent losses of fine tin through the stack. Native Labour.—The number of natives on the company's register on 31st December, 1915, was 676, and the average number at work, monthly, during the year, was 525. No difficulty was experienced in maintaining, from locally engaged voluntary natives, a labour complement equal to the requirements of the mine. Malarial fever was unusually prevalent in this district during the year, and at times seriously affected the working efficiency of the force. An additional 11 round huts, with thatched roofs, were erected during the year. The accommodation for natives is now adequate for our present complement of about 700 boys. A number of additional houses have also been built by the natives themselves in the location. Practically every house is occupied continuously. The mine generally is in a very sound position, and the outlook at the year end 1915 was distinctly more favourable in every respect than the previous year end.

### Value of Technical Societies to Mining Engineers.\*

BY ROSSIER W. RAYMOND.

The secret of the rapidity of modern technical progress is the rapid and abundant interchange of ideas. Knowledge in itself is not power. It is simply weight or force. Knowledge in motion is power; and the formula  $Mv^2$  applies to spirit as well as to matter. Technical societies promote the acceleration of progress: (1) by bringing workers and students together; (2) by persuading them of the advantage of publicly exchanging, rather than jealously hiding, their discoveries and experiences; (3) by training them in the art of clear and conclusive statement; (4) by providing the means of accurate publication, appropriate circulation, and permanent preservation of the important records and results of practice and discussion; (5) by making professional ability known to a wide circle of experts, and thus facilitating personal promotion and success; (6) by assisting in research through the use of their libraries and files of exchanges, not only by those who can personally consult such sources of information, but also by those who are too far away to do this directly, but can enjoy its benefit through the assistance of competent experts provided by the societies; and finally (7) by lessening the loss to science and art caused by the death of experts who carry to the grave their acquired knowledge and wisdom, and leave no man the better for it all. These different functions of technical societies are discussed in the paper at some length. Under the head of publications, especially, the proper sphere and nature of the publications of a technical society, as distinguished from newspaper articles, contributions to technical magazines, graduates' theses, and formal treatises, text books and encyclopedias, is explained, and the special usefulness of competent editorial revision is emphasised. On the basis of this general description, it is suggested that membership in a great technical society ought not to be limited by unnecessary conditions. Moreover, since the first step is to get men together, and the next to keep them together, it may well be understood at the beginning that the united influence of such a society is not to be used for any propaganda whatever.

\* Abstract of paper read at the Second Pan American Scientific Congress.

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## THE NATIVE WAGE BILL OF THE MINES.

### Detailed Statement of the £7,074,692 in Native Wages Paid by Mines in the Union.

THE total wages earned during the year 1915 by Asiatics, Natives and other coloured persons on mines and works, and average wage per month per person working on the mines are as follows:—

Province	Gold Mines. Wages earned.	Total Wages earned for all S. Mines.
<b>TRANSVAAL—</b>		
Witwatersrand—		
Asiatics ... ... ... ...	£38,787	—
Natives and others ... ...	5,736,011	—
Outside Districts—		
Natives and others ... ...	266,342	—
<b>TRANSVAAL—</b>		
Asiatics ... ... ... ...	38,787	£39,835
Asiatics (females) ... ... ...	—	—
Natives and others ... ... ...	6,002,353	6,519,157
Natives and others (females) ...	—	94
Total ... ... ...	6,041,000	6,558,586
<b>CAPE—</b>		
Asiatics ... ... ... ...	—	583
Asiatics (females) ... ... ...	—	—
Natives and others ... ... ...	—	168,260
Natives and others (females) ...	—	5,570
Total ... ... ...	—	174,413
<b>ORANGE FREE STATE—</b>		
Asiatics ... ... ... ...	—	—
Asiatics (females) ... ... ...	—	—
Natives and others ... ... ...	—	81,485
Natives and others (females) ...	—	10
Total ... ... ...	—	81,495
<b>NATAL—</b>		
Asiatics ... ... ... ...	—	85,380
Asiatics (females) ... ... ...	—	463
Natives and others ... ... ...	3,731	174,299
Natives and others (females) ...	—	56
Total ... ... ...	3,731	260,198
<b>UNION OF SOUTH AFRICA—</b>		
Asiatics ... ... ... ...	38,737	125,298
Asiatics (females) ... ... ...	—	463
Natives and others ... ... ...	6,006,084	6,943,201
Natives and others (females) ...	—	5,730
Total ... ... ...	6,044,821	7,074,692
Year 1914 ... ... ... ...	5,361,253	7,372,414
Year 1913 ... ... ... ...	5,602,587	8,198,542
Year 1912 ... ... ... ...	5,965,771	8,505,493
Year 1911 ... ... ... ...	5,742,622	8,181,095
June-December, 1910 ... ...	3,224,347	4,548,540

Wages earned on Witwatersrand gold mines include an amount of £7,774 earned by convicts. Wages earned on coal mines, other areas, Transvaal, include an amount of £59 earned by convicts. The services of convicts on Cape diamond mines are paid for at a nominal rate only, expenditure in connection with this labour being charged to supervision, etc. With the exception of diamond mines in the Transvaal and mines in the Cape, where natives are housed only, it is general for mining companies to provide their coloured employees with free quarters and food. The average wage per month of the native worker on the Rand was 52s. 4d. and in the outside districts 42s. 1d., plus, of course, quarters and food.

### Manicaland Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of March, 1916, was as follows:—Reef: Mill: Gold won (fine), 201 ozs. 10 dwts. 4 grs.; tons crushed, 529; value, £835 5s. 5d. Alluvial: Gold won (fine), 898 ozs. 4 dwts. 19 grs.; cubic metres dredged, 81,910; value, £3,725 11s. 6d.

### Rezende Mines.

The results of the Rezende Mines for the month of March, 1916, were as follows:—Central Section, estimated profit, £45; Old West Section, estimated loss, £86; total estimated loss, £41.

## S.A. MINING YEAR BOOK. 1915.

BY S. R. POTTER  
(Editor, "S.A. MINING JOURNAL.")

**Vol. I.**

### ANNUAL MEETINGS AND REPORTS COMPLETE.

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## SALARIES AND WAGES IN THE MINING INDUSTRY.

### Union Mining Industry White Pay Roll Totals £8,804,983.

The salaries and wages paid to white employees during the year 1915 were as follows:—

Classification.	Witwatersrand	Totals for all S.A. Mines.
<b>TRANSVAAL—</b>		
Technical Staff	£730,314	£945,344
Clerical Staff	367,100	463,923
Other White Employees	6,141,290	6,816,595
Total	7,238,704	8,225,862
<b>CAPE—</b>		
Technical Staff	—	37,505
Clerical Staff	—	36,317
Other White Employees	—	263,519
Total	—	337,341
<b>ORANGE FREE STATE—</b>		
Technical Staff	—	16,806
Clerical Staff	—	5,072
Other White Employees	—	68,863
Total	—	90,741
<b>NATAL—</b>		
Technical Staff	590	32,798
Clerical Staff	—	13,789
Other White Employees	1,823	104,452
Total	2,413	151,039

Classification.	Witwatersrand.	Totals for all S.A. Mines.
<b>UNION OF SOUTH AFRICA—</b>		
Technical Staff	807,465	*1,032,453
Clerical Staff	388,500	519,101
Other White Employees	6,358,841	7,253,429
Total	7,554,806	8,804,983

Year 1914	7,172,269	9,145,864
Year 1913	7,875,397	10,269,080
Year 1912	8,196,353	10,418,272
Year 1911	8,544,689	10,636,252

\* Includes £49,506 paid in salaries to medical officers.

The following figures represent special payments made to, or on behalf of, white employees on active service during the year 1915, and are included in the above table:—

Technical Staff	£9,702	£14,614
Clerical Staff	9,014	15,093
Other White Employees	71,815	163,334
Total	90,531	193,041

† Includes £989 paid on account of medical officers.

### Prospecting Activity Statistics.

The official return of prospecting permits and prospecting, diggers and base metal claims held as at 30th June, 1915, 31st December, 1915, and 31st March, 1916, is as follows:—

Johannesburg	16,045	14,799	14,818
Kruggersdorp	13,194	11,965	11,984
Boksburg	21,207	23,950	24,251
Heidelberg	7,506	7,366	7,367
Ottoshoop	286	560	631
Pretoria	65	65	65
Barberton	13,543	12,628	10,145
Pilgrims Rest	6,360	4,769	4,558
Pietersburg	19,475	22,952	20,268
Klerksdorp	2,480	2,375	2,308
Totals	103,161	101,429	96,305

### Angola Mineral Resources.

Since Mr. W. J. B. Chapman, of Angola, mentioned in the course of an interview with a *Diamond Fields Advertiser* representative last February the wonderful mineral and agricultural resources of that colony, several inquiries have been made with a view to obtaining more particulars of the country, particularly in reference to the steps which have to be taken to secure land from the Government. Advantage was taken during Mr. Chapman's return visit to Kimberley to secure particulars of the procedure, which, no doubt, will be read with interest by the public. There are, by the way, between 150 and 200 Boer farmers already established in Angola, which is evidence of the agricultural fitness of the country, and Mr. Chapman remarked that the great needs of the colony are immigration of settlers and prospectors, as the country is rich in mineral wealth. Gold and copper and other metals have already been recovered, and no doubt there are fine commercial ventures awaiting development. Mr. Chapman was so enthusiastic in his desire to see the mineral resources of the country located and worked, that he said he would place a small transport at the service of experienced prospectors, if this would assist in a pioneer effort being carried out.

### Randfontein Extensions.

Randfontein Extensions, Ltd., announce that in view of the very satisfactory report received from the engineer upon the property situated in the Far Eastern Rand, referred to in the circulator issued to the shareholders on February 12 last, the board has decided to exercise the option held over the said property, the acquisition of which will greatly increase the value and extent of the mining interests held by the company in this district. The company's claims in the West Rand on Farm Waterfall have now been disposed of.

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## IMPROVEMENT IN THE METALLURGICAL TREATMENT OF ORES.

[By Sir R. A. S. REDMAYNE, K.C.B.]\*

In respect of some of our ores there is room for improvement in the methods of extraction of the ore from the gangue or stone, and the economic reduction of the ore to the metal. The decision of the Advisory Council to the Committee of Scientific and Industrial Research of the Privy Council to make a grant in aid of the Research which the Institution of Mining and Metallurgy and the Royal Cornwall Polytechnic Society are conjointly about to carry out in respect of the economic production of tin and tungsten, with special reference to Cornwall, is a welcome sign of the national awakening which is taking place as to the overwhelming importance of scientific and industrial research. The research will probably comprise the following:—

(a) *An Investigation of the Physical Condition of the Tin (and Wolfram) in the Stone.*—The degree of fineness probably varies with the depth, the stone being finest at greatest depth. Much work of a scattered and indefinite kind has already been done in this direction and would have to be linked up and completed. Much work could be accomplished in a month. I should think that within three months' time, this part of the investigation might be completed.

(b) *Determination of the Actual "Percentage of Recovery" at present obtained at the Mines, and Improvement in the Methods of Dressing.*—Curiously enough the precise percentage of recovery of cassiterite now being obtained from the tinstone is at present an unknown quantity, but should, and in my opinion could, easily be established within, say, two or three months. It is, I believe, a very low percentage and capable of considerable improvement. I am convinced that it does not exceed 60 per cent, and should (and could) be increased by improved methods of dressing the ore (which is a purely mechanical process) arrived at by scientific research. Were a resulting improvement of only, say, 5 per cent, secured, it would more than warrant the proposed expenditure (£3,000), but a much better improvement should be secured. The ore, it may be, is being crushed—(a) not sufficiently fine, or (b) too fine for economic classification. Classification methods may be improved. The limits of mechanical methods of extraction

will have to be determined, and when this is reached, it will be necessary to investigate the value and application of (a) volatilisation and (b) of chemical methods of extraction. It is not possible to estimate with accuracy the length of time which would be absorbed in experimenting with a view of laying down principles on which improved methods of extraction would be based, but a great deal of valuable work could probably be accomplished in six months. At the outside I do not think the whole investigation will cost more than £5,000; certainly not more than £3,000 will be expended on the first complete year's work, and this should suffice to establish the vital points. These estimates are based on prolonged and careful consideration, and, I think, can be accepted as reliable.

### THE ORGANISATION AND DEVELOPMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH.

In connection with the industries of mining and metallurgy, the Council of Scientific and Industrial Research has decided to set up a committee to deal with (a) the mining of non-metals; (b) metalliferous mining, and a committee for metallurgy dealing with (a) the metallurgy of non-ferrous metals and (b) the metallurgy of iron and steel, and has requested the Council of the Institute of Mining and Metallurgy to nominate two members to serve on the Metalliferous Mining Committee and two to serve on the Committee relating to the metallurgy of non-ferrous metals, a request to which we have very willingly acceded.

The action of the late President of the Board of Education, in securing the appointment of the Advisory Council to the Committee of the Privy Council to ascertain the best methods of securing the organisation and development of Industrial and Scientific Research, marks a welcome development and may lead to great strides being taken in our industrial methods. But it is not sufficient to organise industry and inaugurate research if we have not the material in the shape of highly-trained persons to undertake research work, organise and captain industry.

\*Extract from Presidential Address before the I. of M.M.

### Companies Registered.

The list of companies registered in March is as follows:—  
The Industrial and Mercantile Trust, Ltd., 2 Permanent Buildings, Harrison Street, Johannesburg; capital £25.  
The R.S.T. Stores, Ltd., 8 Standard Bank Chambers, Commissioner Street, Johannesburg; capital £5,000.  
African British and Continental Seed and Plant Company, Ltd., 52a Pritchard Street, Johannesburg; capital £2,000.  
Anana Estates, Ltd., Roodevoort No. 2148, near Warmbaths, District Waterberg; capital £500.  
Moosajee Mahomed and Company, Ltd., corner Gibson Street and Edward Road, Sophiatown, Johannesburg; capital £500.  
Cachalia Estate, Ltd., Stands 74 and 76, Bree Street, Newtown, Johannesburg; capital £1,000.  
Majamee, Ltd., Stand 56, corner 18th and Delaroy Streets, Vrededorp, Johannesburg; capital £500.  
Lewis Brothers, Ltd., 81a Elloff Street, Johannesburg; capital £5,000.  
T. Ebrahim, Ltd., Excelsior Street, Pietersburg; capital £300.  
Goolam Rasool, Ltd., 53 Market Street, Pietersburg; capital £200.  
Dookhees, Ltd., Dowling Avenue, New Clare, Johannesburg; capital £500.

Mayat, Ltd., 159 Market Street, Johannesburg; capital £1,900.  
The Clubman, Ltd., Unionist Party Club, Noord Street, Johannesburg; capital £100.  
Bhana, Ltd., 74 Bree Street, Newtown, Johannesburg; capital £1,000.  
Chothia & Sons, Ltd., 76 Plein Street, Lichtenburg; capital £100.  
Amajee & Son, Ltd., Market Street, Vrededorp; capital £2,000.  
New United Film Supply Company, Ltd., 8 Steyler Buildings, Loveday Street, Johannesburg; capital £400.

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## RAND EARTH TREMORS COMMITTEE'S REPORT.—VII.

### Exhaustive Review of the Subject—Historical and Descriptive—Valuable Recommendations.

**75. Large Number of Small Pillars.**—In the case of a mine in which there were a large number of small pillars against one with a few large pillars, the effect of pressure would be that these would crush more or less successively and not simultaneously. Owing to the irregularities in the strata and the faults and joints in them, the pressure can never be evenly distributed. Some pillars would therefore be subjected to more severe pressure than others, and would yield sooner, and thus the bursting would be successive.

**76. Accumulated Pressure.**—A large pillar, on the contrary, would resist great pressure, but when this finally accumulated to such an extent as to exceed the strength of the pillar, a single burst of great severity would take place.

**77. Mining Without Pillars.**—It may appear at first sight that the obvious remedy to apply is to avoid leaving in any pillars at all in a mine, either large or small. Even if this were not impracticable, it might result in the pressure being thrown on stope faces and on the blocks of ground which are being diminished in area by mining, with the result that severe bursts might take place in these, causing shocks which might possibly be as violent on the surface as those now experienced.

**78. Classification of Pillars.**—The pillars in mines may be classified as follows: (a) Drive pillars; (b) stope pillars; (c) blocks of unpayable ground; (d) shaft pillars. In the case of drive pillars and stope pillars, their value when the pressure is great is only temporary. While they are generally small and their fracture can hardly cause any but a minor shock, there seems to be no sound reason why they should not be removed as soon as possible after their useful purpose has been fulfilled. This can in most cases be done by supporting the surrounding area on packs or other artificial means, and then drilling and blasting the pillar. In many instances the number of such pillars could be largely diminished, and their place taken by systematic packing close to the face.

**79. Levels Diven in the Footwall.**—To obviate the bursting of drive pillars, the levels may be driven in the footwall and the reef exposed by a series of crosscut raises. The disadvantages of this method would be most seriously felt by mines in which there is only a small percentage of payable rock. The difficulties of finding the zones of profitable ore would be greatly increased, and the method is therefore probably economically inapplicable to this class of mine. Even in the more profitable mines the changes in value and in the percentage of payable ore are sometimes rapid, and placing all the levels in the footwall would enhance the difficulty of gaining information about such changes, but the method might with advantage be applied to those cases where there is a sufficient uniformity of value.

**80. Replacement of Drive Pillars.**—Where drive pillars show a tendency to fracture and burst, they should either be made large enough to withstand the pressure until the stope is exhausted, and be mined as soon as possible thereafter, or should be entirely discarded and replaced by substantial packing. The latter system is especially to be recommended, and is in successful operation in the Ferreira Deep.

**81. Stope Pillars.**—Only sufficient pillars should be left in stowing to prevent the stope becoming dangerous to the workmen, and they should be removed as soon as possible, as suggested in paragraph 78. Pillars cannot be entirely avoided in any mine, especially in those cases where faults

occur and have to be packed to support the stope. Some mines to which it is necessary to leave pillars in the stope extend sets of bolting, which will support the lives of the workmen or cause the loss of the pillars. In most cases pillars need not be left, though it is often the case that they are intended being generally used for the carrying of packing of various kinds.

**82. Blocks of Unpayable Ground.**—In the case of blocks of unpayable ground, the blocks are usually relatively very large, and therefore able to resist great amounts of pressure. The Committee has not had any experience in its native vines where a shock has been transmitted through one of several blocks. Where a capacious space exists between the blocks of ground exists an area of high pressure, which probably is better and frequently less dangerous than the area of a fissure, for the collapse of a fissure may give serious results if important sections of the mine are thereby passed from the effects on the surface.

**83. Shift Pillars.**—The removal of shift pillars is a difficult one to deal with. It is to the bursting of such pillars that the most severe shocks yet felt in the Johannesburg mines owe their collapse, has at the time of the first occurrence of disaster financial loss, as well as great loss of life.

**84. Waterborne Sand-Filling.**—In the case of existing vertical and incline shafts, protected by pillars of intact ground as already described, where increases of pressure begin to show themselves it is suggested that probably the safest procedure is to fill the surrounding area extensively with waterborne sand, as being the most complete filling known, and then to remove the pillars with caution. It is clear that the operation is one demanding great judgment and skill, and that it is not to be lightly undertaken again. The disastrous effects of the bursts at the Fairview Deep and the Village Main Reef have, however, shown how serious a matter it may be, and there is no doubt that in these cases the bold step suggested had better been taken in time, the results would have been less disastrous.

**85. Protection of Future Shafts.**—In the case of future shafts, it is suggested that the pillar for any deep vertical shaft be never made less than 500 feet in diameter. If the shaft is situated in a section of the reef which is largely unpayable, such an extensive shaft pillar may be unnecessary, but the payable ore in the pillar is of little value and its ultimate recovery is facilitated by the initial portion of it. The alternative of making the bottom of the vertical shaft fall well below the reef plane has also been suggested so that the removal of the reef in the neighbourhood of any subsequent moving of the strata would have little effect on the shaft station and other important arrangements situated at this point.

**86. Incline Shafts to be in Footwall.**—Deep incline shafts should as far as possible be placed well in the footwall, and where the reef is thrown into the shaft, the pillars left on either side of the shaft should be sufficiently large to obviate any danger of a fracture from pressure in the vicinity of the shaft. Even if a pillar of the width of 100 feet should be required on each side of the shaft, this should not be begrimed, for as is the case of the vertical shaft pillar, the payable ore contained in it is not lost, but can be won when the rest of the mine is exhausted.

(To be continued.)

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### MINING EXAMINATIONS.

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## APPLICATION OF ELECTRIC POWER TO RAND MINING WORK.—V.

[By J. NORMAN BULKLEY.]

*Control.*—This is by means of the well-known regulation of the generator field and hardly needs comment. There are systems of control using rotary converters, and others with what might be termed "bucking motors," but so far as the writer knows, these have not been used on the Rand. When considering Ward-Leonard control, one fact should be borne in mind and that is that every position of the control lever is equivalent to fixed generator excitation and as the hoist motor has shunt characteristics the hoist speed must be practically definite, no matter what the load is or even if the torque be negative. This, of course, makes the control very easy for the driver.

### RESULTS WITH ELECTRIC WINDING.

In a paper of this sort it is practically impossible to present tabulated comparisons of costs with steam and electric winding, as in most cases the steam winders were supplied from boiler plants in common with other engines so the amount and cost of steam used by the winders was a matter of doubt. Careful comparisons showed the costs to be in favour of electric winding, the saving in the case of some of the deep shafts (4,000 ft.) amounting to at least 12½ cents, per ton. One unlooked for result was a marked decrease in the cost of maintenance of shaft guides, owing to the steadier turning moment of the electric winder. As to safety and reliability there can be no question but that under Rand conditions the advantage is strongly with the electric hoist. As a comparison of the efficiencies of Ward-Leonard and rheostatic control two shafts having conditions as nearly alike as possible have been selected. These are No. 2 of the Van Ryn Gold Mining Co. and that of the Meyer and Charlton Gold Mining Co. The Van Ryn is equipped with a geared three-phase rheostatic winder handling 5-ton rock loads at 1,500 ft. per minute, with a monthly tonnage of about 22,000 tons. The Meyer and Charlton Gold Mining Co. has a direct-coupled Ward-Leonard hoist operating at 2,500 ft. per minute, with 5-ton skips of design and weight similar to those at the Van Ryn, but with a monthly tonnage of about 17,000 tons. Careful records of the performance of these hoists were kept, and the results for a year's work plotted together with the shaft horsepower-hours. A study of this curve will show that where the Ward-Leonard set has been kept working steadily, its efficiency exceeds that of the rheostatic set by about 5 per cent., but where the shaft horsepower-hours have dropped, the efficiency of the Ward-Leonard set has dropped with it, thus showing clearly the bad effect of intermittent hoisting due to the practically constant losses of the motor-generator set, while with rheostatic control the only loss when the hoist is standing is that due to the controller pump motor which is negligible. The regularity with which hoisting can be carried on is well shown by the recording wattmeter and tachograph charts taken from the Meyer and Charlton plant. The wattmeter chart also shows clearly the effect of the dynamic braking in returning power to the line. Of course, to obtain such regularity it is necessary to provide suitable loading arrangements. For vertical shafts a modified form of the well-known Kimberley measuring loading chute has been found to answer well. For incline shafts, owing to the difficulty of quickly loading the skip full it was necessary to develop a form of measuring chute with a drop lip to deliver the ore well into the skip, and which in the closed position would keep this lip well clear of the skip way. Such a chute has answered very well.

### COMPARATIVE COST OF ELECTRIC AND STEAM POWER.

The writer would have liked to present tabulated statements of comparative costs of steam and electric driving of complete mining plants. This was impossible, as changes made in plants at the time of electrification would have made such comparisons seem unreliable except to those who had full knowledge of such changes. Also, in many cases steam

had never been used. In one mine under the writer's charge, a complete change from steam drive to electric was made, the only boiler left in the plant being that supplying steam for cooking and wash water. In this particular case the question of the change was largely influenced by the fact that the mine was nearly at the end of its life. The acquisition of new ground gave the mine a much longer lease of life, and to continue with the existing steam plant would have meant a large amount of expenditure on power plant for renewals and repairs. For these reasons this installation could be regarded more or less as the equipment of a new mine. At the time this change was made the milling capacity was increased from 15,000 to 17,000 tons per month and a new compressor having 33 per cent. more capacity installed. A study of the steam power costs for the last two years the plant was in operation and electric power costs for a year's service showed the saving in favour of electric drive to be \$42,000 per annum without making any allowance for the increased power required by the additional tonnage treated and additional air supplied. My thanks are due to E. Farrar, my former colleague in the General Mining and Finance Corporation, for his kindness in supplying the drawings and much of the information used in the paper.

## RAND MINES, LIMITED.

(Incorporated in the Transvaal.)

### NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twenty-first Ordinary General Meeting of Shareholders for the year ended 31st December, 1915, will be held in the Board Room, The Corner House, Johannesburg, on Wednesday, 21st June, 1916, at 11 a.m., for the following business:—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1915, and the Reports for the Directors and Auditors.
2. To elect Directors in the place of those retiring in accordance with the provisions of the Company's Articles of Association.
3. To determine the remuneration of the Auditors for the past audit and to appoint Auditors for the ensuing year.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Share Transfer Books of the Company will be closed from the 21st June, 1916, to the 27th June, 1916, both days inclusive.

Holders of Share Warrants to Bearer who desire to be present or represented at the Meeting shall produce their Share Warrants (or may at their option deposit same), at the places and within the times following:—

- (a) At the Head Office of the Company in Johannesburg, at least 24 hours before the time appointed for the holding of the Meeting.
- (b) At the London Office of the Company, No. 1, London Wall, Buildings, E.C., at least thirty days before the date appointed for the holding of the Meeting.
- (c) At the Office of the Credit Mobilier Francais, 30 and 32, Rue Taithout, Paris, at least thirty days before the date appointed for the holding of the Meeting.

and shall otherwise comply with the "Conditions as to the issue of Share Warrants or Bearer Shares" now in force.

Upon such production or deposit a Certificate, with Proxy Form, will be issued under which Share Warrant holders may attend the Meeting either in person or by proxy.

By Order of the Board, •

S. C. STEEL, Secretary,

Head Office: The Corner House,  
Johannesburg, Transvaal,  
29th April, 1916.

## THE SHIPPING QUESTION AND SOUTH AFRICAN INDUSTRIES.

(Contributed.)

IT may seem a far cry from agricultural disabilities to the provision of additional shipping facilities. But the agriculturalist's difficulty in the best sense of the phrase is the opportunity of the shipping agent—not however, to injure, but to benefit. At the present time we have the position that all those interested in distributing the raw produce of the soil, which we have or can produce in superabundance in South Africa, are being held up, whether in their efforts to send them round our own ports or oversea, by the lack of transport facilities. Truck loads of coal, lime and similar substances are being held up on the railways. At the ports there are cargoes of mealies and other cereals which do not improve by keeping and will, if not used, be eaten up with weevil, owing to there being no ships to carry them. It is idle to blame the Union-Castle or other companies for this. They must look after their own interests. Apart from the fact that the exigencies of the war are making a call upon their resources, which they can scarcely meet, they must give preference to those products upon which the freight is highest. The raw products are heavy and bulky, and the freight is the lowest. Although all the shipping companies trading with South Africa have been continually increasing their fleets, and find the expansion most profitable, yet there is the best authority for the belief that they would welcome any supplementary efforts to take from them the lower grade work. It is time that persons interested in shipping ventures got to work, not only to meet the present emergency, but what is infinitely more important, to cope with the further great expansion in trade which will take place when the war is over. The matter is not merely a war emergency, but is for all time, as South Africa is destined to become one of the world's greatest producers. This is not a question in which we can, on the old South African principle, wait for the intervention of the State. Nowhere, for reasons which need not be stated here, have Governments been able to initiate any shipping enterprise on a commercial basis. Statistics show that nearly all the great shipping companies of the world have been started by individuals with a small capital, and that in almost every instance they have been successful and to-day control a powerful fleet. Australia, Tasmania and New Zealand started on these lines. The Tasmanian Shipping Company was formed some 60 years ago, with a capital of only £40,000, and to-day this and other shipping companies in Australia own 360,000 tons of shipping, and employ over 7,000 men.

### A JOHANNESBURG ENTERPRISE.

It is interesting to note that certain ventures in this direction have already been made in South Africa, and in particular that a Johannesburg company, the South African Shipping Company, of which particulars appear in our advertising columns, has stepped into the breach.

But this is not enough, and a large fleet, requiring the energies of several companies, will ultimately be required. To the public in this connection, and especially to those promoting industries, it is necessary to point out one consideration. The old economic theory of the "balance of trade" made it plain that a nation accustomed to export less in value than what it imported, was on the down grade. But that if it, by profits on the carrying trade, more than compensated for this loss, it was in a sound position. This is the secret of England's trade supremacy in the past, and for South Africa it must be the secret of its position in the future.

### THE COAL QUESTION.

The question of coal transport is a vital one. We have two grades of coal in South Africa, the Natal product, much of which is nearly equal in grade to the best Welsh, and the Transvaal coal which is, generally speaking, of a lower calorific value and which fetches a less price. At present these are in active competition, and the question of transport decides the preference in most cases. There can be no doubt that it would be more economical to transport the higher value Natal coal to South America, Mauritius, or other far distant markets and keep the Transvaal coal for use in local industries and for supplying the coast ports and the nearer markets of Ceylon and the East Indies. This company proposes to arrange for a coastal scheme which will also have every convenience for the carriage of the latter along the coast of Africa as well as to provide for transporting of the former to the more distant markets of the southern hemisphere, for which South Africa is the geographical centre.

## NOTICE

*Controlled under Munitions of War Act 1915  
(Great Britain)*

**SIEMENS BROTHERS DYNAMO WORKS,  
LIMITED**  
*(LONDON AND STAFFORD.)*

**SIEMENS BROTHERS & COMPANY,  
LIMITED**  
*(LONDON AND WOOLWICH.)*

**NOTICE IS HEREBY GIVEN THAT**  
Mr. A. J. G. Simpson, Norwich Union  
Buildings, St. George's Street, Cape Town,  
has been appointed Representative of the  
above Companies for SOUTH AFRICA, and  
all communications should be addressed to  
him at the above address.

DATED at CAPE TOWN, this 4th day  
of April, 1916.

**A. J. G. SIMPSON.**

Norwich Union Buildings,  
St. George's Street,  
Cape Town,



## THE WEEK IN THE SHAREMARKET.

### Business Quiet Owing to Holidays—Dividend Payers in Demand

Owing to the Easter holidays the market only reopened on Tuesday, when business was naturally restricted pending the arrival of London cables. Wednesday's and Thursday's operations were somewhat adversely affected by the Irish news, and actual sales on High Change fell to fifteen. Speculative small stocks have for the time being been pushed, with the exception of S.A. Lands, which have been in good demand. The small boom in Lace Props. has fizzled out for the moment. Coal Trusts, the feature of last week, fell back to their normal level, hardening again slightly on Friday morning. Bantjes have also died away gradually. Knight Centrals and Randfonteins continue neglected and weak. Leeuwpoort Tins relapsed after a short spurt. Springs and Government Areas were in good demand at somewhat lower rates. Pretoria Portland Cements are again wanted at advanced prices. The same may be said also of Consolidated Langlaagte and Witbank Collieries, the latter stock being most difficult to obtain. Sub Nigels have been rather largely bought at improved prices. The Medder stocks are again marked up, the B. group justifying their backers by passing their Deep rivals.

	Tues. 18th.	Wed. 19th.	Thurs. 20th.	Tues. 25th.	Wed. 26th.	Thurs. 27th.
Adair Ubers	—	—	—	—	—	—
African Farms	11 10	11 3*	11 9	11 8*	11 9	11 8*
Afriplex Mines	5 6*	5 6*	5 3*	5 9	5 9*	5 10*
Auraria Wests	11 6*	11 0*	11 0*	—	—	—
Bantjes Cons.	17 6	17 3	17 0	16 11	17 0	16 8
Braspan Mines	76 6	76 6*	76 6	76 6	76 6*	76 6*
Breyten Collieries	20 0	20 0*	—	20 0*	20 0*	20 0*
Brick and Potteries	—	5 0*	5 0*	—	5 0*	5 0*
Busbyfield Tins	—	8 *	—	—	0 6*	—
Cased Cals	20 0*	20 6*	20 0*	20 0*	—	20 0*
Cinderella Cons.	6 9	6 9*	6 9*	6 6*	6 6*	6 6*
City and Suburbans	31 3	31 4*	31 6*	31 4*	31 6*	34 3
City Deeps	73 6	73 9*	74 3*	74 3*	75 0	75 0
Cloudfield Mines	9 1	8 11	8 10	8 9*	9 0	8 9*
Clydesdale Colls.	11 6*	—	—	11 6*	—	—
Concrete Construc.	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
Con. Investments	17 6*	—	17 6*	17 6*	—	—
Con. Langlaagte	—	31 6*	32 0*	—	—	32 0*
Con. Main Beefs	19 6*	19 6*	19 9	19 3*	19 3	19 0*
Con. Mines Selv.	18 6*	—	18 6*	18 6*	—	—
Coronation Colls.	20 6*	—	20 0*	—	30 0*	—
Coronation Freeholds	0 5	0 5	0 5	0 4*	0 4*	0 4*
Coronation Synd.	3 6*	—	—	2 0*	2 6*	—
Crown Diamonds	2 3*	2 3*	2 3*	—	—	2 0*
Crown Mines	—	—	50 0*	50 0*	50 0*	50 0*
Crown Mines Debts	—	—	£100+	—	—	—
Darwin Road. Deeps	—	—	—	12 6*	15 6*	—
East Rand Centrals	7 11	8 0	8 6*	8 1	8 3	8 2*
East Rand Coals	3 6	4 5	4 0	4 2	4 0	3 11
East Rand Deeps	4 9*	1 10	1 9*	4 10*	4 10*	4 9*
East Rand Propri.	16 6	16 6*	16 0	15 3	15 3*	15 6*
East Rand Debs	£78*	£78*	£78*	£78*	£78*	£78*
Eastern Gold	2 2	2 1	2 1*	2 1	2 0*	2 0*
Frank Smith Dias	2 8*	2 0	2 7	2 6*	2 6	2 0*
Geduld Props.	41 9*	41 6*	41 3	41 3	45 3	44 9
Glencairns	2 0*	2 6*	2 0*	2 0*	—	—
Glencairns Colls.	6 6*	—	7 0*	7 0*	—	6 6*
Glyn's Lyden	12 0*	12 0*	12 3*	—	12 6*	12 6*
Groot Areas	31 3	31 34	31 6	31 6*	31 6*	31 6*
Imp. Tires	6 6*	6 7*	6 6*	6 6*	6 9*	6 9*
Kirkaldy Propri.	2 0*	2 6*	2 6*	2 0*	—	2 0*
Knight Centrals	11 7*	11 8	11 7*	11 6	11 3*	11 6
Knights Deeps	9 6*	—	21 0*	—	—	—
Lace Props.	7 6	7 5*	7 6	8 3	7 9	7 6
Lierpaardsveil. Est.	7 6*	7 9	8 61	—	—	7 0*
Lyden. Farms	9 10	9 10*	9 6	9 7	9 6*	9 4
Mata Beef Wests	8 1	8 3	8 31	8 0*	8 2	8 0†
Meyer and Charlton's	—	—	106 0*	—	—	—
Middeleld. Est.	2 6*	1 9*	2 0†	—	—	1 6*
Medder B's	128 0	126 6*	126 6	128 0	127 6*	129 0
Medder Deeps	127 6	126 6*	126 6	127 0*	128 6	128 0*
Natal N.W. Colls.	16 9*	17 6*	—	—	—	—

\*Odd lots. †Ex London. \*Buyers. †Sellers.

	Tues. 18th.	Wed. 19th.	Thurs. 20th.	Tues. 25th.	Wed. 26th.	Thurs. 27th.
National Banks	226 0*	222 0*	222 6*	226 0*	222 6*	222 6*
New Boksburgs	—	2 1*	2 0*	2 3	2 0*	2 3†
New Eland Dias.	17 6*	17 6	20 0	18 0*	17 6*	—
New Era Cons.	8 10*	8 10	8 10	8 11	8 10*	8 11
New Geduld Deeps	5 0	5 0	5 2	5 6	5 8	5 6
New Gochs	—	15 0†	—	—	—	—
New Heriots	—	—	—	—	54 0*	53 9*
New Kleinfonteins	30 6	30 4½	30 9a	31 0	30 9*	30 6*
New Modders	—	338 9	—	335 0*	338 9	337 6*
New Rietfonteins	0 9*	0 9*	0 9	1 0†	—	0 8*
New Unifeds	—	11 0*	10 6*	6 0*	—	10 6*
Nigels	6 0*	6 0*	6 0*	6 0*	—	—
Pretoria Cements	66 0*	66 0*	66 0*	67 6	67 6*	67 0*
Princeps Estates	2 9*	3 0†	2 9*	2 3†	2 9*	2 9
Rand Collieries	4 0	3 6*	4 3†	4 0†	—	—
Rand Klips	8 8	8 6	8 3	8 3	8 8	8 7
Rand Nucleus	2 6	2 6	2 2*	2 6†	2 0*	2 1*
Randfontein Deeps	4 0	3 0*	4 0*	4 0*	1 1	4 0*
Randfontein Est.	13 3	13 0	13 3	13 3	13 0*	13 0*
Robinson Deeps	—	21 0†	—	21 0†	—	—
Rooibergs	11 6*	11 3*	15 0	11 6*	14 9*	14 6*
Rood. Uniteds	7 6*	7 9*	7 9	7 9*	7 11	7 9*
Shebas	—	—	—	—	2 6†	2 6†
Simmer Deeps	—	1 6	2 0*	1 9*	1 10*	1 9*
S.A. Breweries	28 6*	—	28 6*	—	—	28 0*
S.A. Lands	6 1	5 10	6 0	6 4	6 5	6 4
Springs Mines	55 9	54 9*	54 9	54 6	51 0	53 9*
Sub-Nigels	13 9	13 6*	13 6*	13 0†	13 4½	13 6*
Swaziland Tins	—	—	—	—	—	23 0*
Trans. and Delagoa	42 0*	—	—	42 0*	42 0*	42 0*
Trans. Coal Trusts	69 0*	69 3a	67 6*	67 0	65 3*	65 0
Transvaal Londs	14 6†	—	—	—	15 6†	—
Trans. G.M. Est.	20 6*	20 6*	21 0*	21 0*	21 0*	21 0*
Tudors	—	2 0*	—	—	—	2 0†
Van Dyks	—	—	3 0*	3 0*	3 0*	—
Van Ryn Deeps	64 6	61 0	65 0	65 6	65 6*	65 6*
Village Deeps	32 6*	32 6*	32 6*	32 6*	32 6*	33 0†
Village Main Beefs	—	—	—	—	—	20 0†
Vogel Con. Deeps	2 5	2 1	2 3*	2 0*	2 1*	2 0*
Wedgeklads	22 6*	24 0*	24 6*	23 6*	23 9*	24 0*
West Rand Cons.	—	—	—	—	—	6 6*
Western Rand Est.	2 3†	—	1 6*	2 0	1 9*	1 9*
Withank Colls.	40 6*	40 0*	40 0*	42 0*	42 6*	42 6*
Witwatersrand	54 0*	54 0*	54 0*	54 0*	—	—
Wit. Deeps	24 9*	25 0*	25 6*	25 0*	25 6*	25 3
Wolbuters	11 6*	11 0*	11 0*	11 2	11 0*	10 9*
Zavaplats Tins	13 6	13 3	12 9	13 0	13 0*	13 0
— Odd lots.	*Buyers.	†Sellers.	‡ Odd lots.	§ Buyers.	Sellers.	

### ANSWERS TO CORRESPONDENTS.

- All inquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to inquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.
- "Anxions."—The accounts of the Leydsdorp Mine for fifteen months to May 31, 1915, were submitted on December 14, 1915, and showed property account, £57,550; Dalston factory account, £132; London expenditure, £1,631; calls in arrear, £1,811; cash, £1,552; creditors, £184; share premium account, £1,216. Work appears to be at a standstill.
- "Randite."—In October, 1913, 737,560 Henderson's Transvaal Estates shares were offered to shareholders pro rata at par, subscribers having an option for twelve months after the end of the European war over one share at par for each share taken up.
- No. 91 (Pilgrims Rest).—(1) Yes, the reef underlies all of them. (2) Should improve in value later. (3) Yes. (4) A speculation. (5) In liquidation for some years.
- "W. H. H."—On present monthly profits, there is no reason why the dividend should be reduced.
- "E. S."—Quite unfounded.
- "Shareholder."—Full details will be given in the forthcoming annual report, which is in preparation.
- "H. R. W." (Kimberley).—Harrisdale Diamonds went into liquidation some years ago. A small distribution was made to the shareholders. Better write to the Master of the Supreme Court, Pretoria.

## THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

### Business Neglected Through the Agricultural Show Week—A Record Exhibition for Johannesburg—Some Industrial Exhibits.

THE Show week has quite overshadowed the ordinary business, starting with the Easter Monday public holiday, which created quite a true holiday spirit. In fact, the general run of traders, who were not catering for the holiday folk seemed out of it, and were perfectly made to join the eight seers. The Agricultural Show itself had proved an all-around record one, therefore a few brief notes will not be out of place.

The motor industry is again very much to the fore, and drew record crowds to view the latest improvements and novelties. Space will not permit of too many details, but one unique motor exhibit must be mentioned in the shape of a small double-furrowed plough made in Leeds. The compactness had little to be desired, as it almost reminds one of a piano. It must of necessity be many years to even think of replacing oxen, but the export meat trade which is again starting next month may hasten the time when more of the farm work will be done by motor driven machinery. Whilst on the subject of agriculture, it is pleasing to record that a firm is successfully coping with a difficulty arising from the war, by making every kind of plough share required by the many varied types of ploughs, also essential parts of agricultural machinery. The many kinds of plough shares and machinery parts cannot be obtained from oversea, especially from the Continent.

The hall of industry is a revelation in itself, all the diverse exhibits being assisted by copious literature. The S.A. wool display is one of more than passing interest, as it is producing quite a good commercial blanket which should become a decided success as we have the best ready-money market in the world, with the natives on these gold fields for this particular article. There are other things on show, but at the moment blankets seem the outstanding feature. The milling industry of Johannesburg with its manifold exhibits of what can be done with South African maize and wheat is a review and forecast of the likely happenings in the future. The leather tanneries, one of Johannesburg and one of Pretoria, also have excellent exhibits. Hitherto there have been many difficulties, which usually appertain to new industries, in establishing a flourishing tannery in the Transvaal, but the present prospects seem very promising to this end. The war conditions have practically stopped British leather and in a measure the Australian article seldom comes, therefore our people have risen to their opportunity by pushing Transvaal leathers, not only for boots and harness but the various needs of the mining industry.

The paint, gloss, and leaded light industries are deserving of notice. The Johannesburg people are increasing the manufacture and mixing of the imported raw materials, so that it is becoming quite a flourishing industry. Perhaps the leaded light production, as well as the mirror manufacture have made the most progress of late. The leaded ornamental lights are made from start to finish as regards the design and every detail of workmanship, which also apply to the manufacturing of mirrors either for replacing broken parts, or in their entirety. Another important industry is taking firm hold for supplying Johannesburg and the Reef with doors, windows, easements, mantels, household and educational woodware, also ladders, commercial packing boxes, toys, etc. The Denver works alone manufacture 1,500 doors monthly, 700 windows, and from 4,000 to 5,000 easements, with up-to-date machinery and plant. They moreover contend that woodwork made on the spot is better able to stand the searching conditions of the Transvaal climate.

**Bacon, etc.**—This is one of the industries ever on the increase, and there are a number of Johannesburg, Transvaal, Natal and Cape exhibits. The Cape Western Province has the largest show of breakfast bacon, all of which has been secured by a Johannesburg provision merchant. The opportunity has been readily seized to place South African

breakfast bacon on the market, since bacon is a commodity in great scarcity and dear. The range of soap, candles of all description, glasses, cutlery, tools and furniture, hardware, wasing soda, etc., is well to the front, bidding strongly to control the market. The market for soaps and bath salts. The Boksburg Tin Works and Gouland Works also do well in the running with fire-braces, as their show is excellent. The cotton exhibit by the Government showed that the initial difficulties about growing cotton are being overcome, but there was a difficulty about dealing with the cotton seed. It was gathered that expensive machinery is absolutely essential to extract the oil and turn the hulks into the many and varied commercial uses, according to the methods adopted in America and Europe chiefly. The maize samples seemed much the same as in other years. The outstanding feature about maize throughout the show is the uses it is being locally turned to.

**Vehicles.**—The show of South African made wagons, carts, trolleys and every other road conveyance is rather better this year, but the imported vehicles are not so plentiful. One good feature is that it has become the custom to use steel tyres on the ox wagon wheels, in lieu of the iron variety. There have been quite a number of sides of wagons, tradesmen's trolleys and delivery carts, but the phaetons and carriage chassis have not been so well patronised. Natal seems to hold the foremost place for supplying the big road wagons, Scotch carts, and heavy goods. However, it was gathered that in the vicinity of Johannesburg, Krugersdorp and Potchefstroom the wagon industry is still of importance. Perhaps much of this work does not come up to the standard of show vehicles, nevertheless it serves its own particular purpose especially as regards the price and utility.

Another important feature is the exhibits from the Trades and Industrial Schools. Much commendable work is in evidence made by the coming generation, in carpentry, joinery, blacksmithing, mechanics, plumbing, electrical goods, etc. The agricultural machinery is better housed in its new quarters, and it is surprising, considering the difficulty of getting goods from oversea, what excellent and varied stocks are still available by our great importing houses. Steam power is apparently giving place more and more to the compact motor. The usual assortment of mine and irrigation pumps at work giving great columns of water, was quite up to standard.

#### REVISED PRICE LIST.

Approximate war prices, subject to quick change.—Mining and building hardware: Iron, imported, round up to 1 in., 27s. 6d.;  $\frac{1}{2}$  in. to 2 in., 18s. 6d.;  $\frac{1}{4}$  in. to 6 in., 25s. per 100 lbs. Do., square, up to 1 in., 27s. 6d.;  $\frac{1}{2}$  in. to  $\frac{1}{4}$  in., 18s. 6d.;  $\frac{1}{4}$  in. to 5 in., 25s. Flats, 3-16 in., 37s. 6d.; all from  $\frac{1}{4}$  in. up, 25s. Angles,  $\frac{1}{2}$  in. to 3-16 in., 30s.;  $\frac{1}{4}$  in., 27s. 6d.; 5-16 in. to  $\frac{1}{4}$  in., 25s., excepting 5 x 4 x 3 in.; mild steel bar, 3*d*. lb.; drill, 6*d*. lb.; tool, 7*d*. to 9*d*. lb.; steel plates, 10*f*. x 4*f*. x 1-16*i*., 27s.; do.,  $\frac{1}{2}$  in., and 3-16 in., 26s. 6d.; 1*f*. and upwards, 25s.; 10 ft. x 5 ft. x 1-16 in., 28s. 6d.;  $\frac{1}{2}$  in. and 3-16 in., 26s.; 10 ft. x 6 ft. x 1-16 in., 28s. 6d.; 3-16 in. x 10 ft. x 1 ft., 26s.;  $\frac{1}{2}$  in. up, 10 ft. x 4 ft., 25s. to 27s.; hexagon bolts,  $\frac{3}{4}$  in. to 3 in., 8d. per lb.; over 3 in., 7d. lb.;  $\frac{1}{2}$  in. up to  $\frac{1}{2}$  in., 50s.;  $\frac{1}{2}$  in. to 6 in., 47s. 6d.; 6*f*. and over, 48s.; 2*f*. up to 2*f*. 4*f*.; 2*f*. to 6 in., 42s. 6d.; 6*f*. and up, 37s. 6d.;  $\frac{3}{4}$  in., 3*f*. and 1*f*. up to  $\frac{1}{2}$  in., 40s.;  $\frac{1}{2}$  in. to 6 in., 37s. 6d.; 6*f*. and up, 32s. 6d. 100lb. Nuts, 2 in., 9d. lb.;  $\frac{1}{2}$  in., 50s.;  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in., 47s. 6d.;  $\frac{1}{2}$  in. to 1*f*., 52s. 6d. per 100 lbs.; 2 in., 7*d*. per lb.; washers,  $\frac{1}{4}$  in. and under, 35s., and above that size, 30s. per 100lb.; shoes and dies, 32s. 6d. to 35s. per 100lb.; rails, £15*s*. per ton; picks, 4 lbs., 22s. 6d. per doz.; shovels, 32s. 6d. to 42s. 6d. per doz.; hammers, drill, 7*d*. to 9*d*. lb.; hammer handles (best American), 14 in., 3s. 6d.; 24 in., 5s. 6d.; 30 in., 7s. 6d.; 36 in., 10s. 6d. per doz.; metal, anti-friction, 1s. per lb.; galvanised iron, 24 gauge, 6 ft. to 10 ft.,



# FLOWER BRAND MAGNOLIA METAL

HAS  
A CO-EFFICIENT OF FRICTION FROM 33½% TO 50%  
LOWER THAN ANY OTHER ANTI-FRICTION METAL.

**MAGNOLIA ANTI-FRICTION METAL CO., of Gt. BRITAIN, Ltd.,** 49, Queen Victoria St., LONDON, E.  
Sole Agents for South Africa : **FRASER & CHALMERS, Ltd.,** Johannesburg, Bulawayo & Salisbury.

9d., 11ft., 10d., 12ft., 10½d.; 26-gauge, 6ft. to 10ft., all lengths, 8½d. to 8½d. per ft. all-round; flat galv., 18 to 24 gauge, 32s. 6d.; 26 gauge, 34s. 6d. 100 lbs.; floor brads, 30s.; ceiling, 30s.; wire nails, 27s. 6d. to 32s. 6d. per 100 lbs.; solder, 50 per cent., 1s. 2d. per lb.; locks, rim, 45s.; mortice, 60s. doz.; barbed wire, 22s. 6d. to 25s. 100 lbs. coil.

**Timber:** Deals, Baltic, 9 x 3, up to 16ft., 11d.; over, 11½d. to 1s. (Oregon, 10½d.); flooring, 4½ x ¾ and 6 x ¾, 5½d. to 5½d. per sq. ft.; do., 4½ x 1½, 6½d. to 6½d.; and 6 x 1½, 6½d.; Oregon edge grain, 5½d. and 6½d.; ceilings, 6 x ½, 3½d. to 3½d. per sq. ft.; Oregon, 4 x ½, 4½d.; pitch pine, 6s. 6d. to 6s. 9d. per cub. ft.; Oregon, 5s. per cub. ft.; clear pine, ½ in. x 12 in., 7½d. per ft.; 1 in. x 12 in., 8d.; teak, small planks, 15s. per cub. ft.; do., large, 16s.; jarrah, 8s. 6d. per cub. ft.; poplar 1 in. x 12 in., 8½d.; scantling, 9 x 3, 11d. to 1s. per ft.

**Bricks, cement, lime, etc.:** Cement, nominal, 34s. 6d. per cask; Pretoria Portland, 9s. 3d. per bag; 8s. 3d., truck loads; lime, white, 7s. 9d.; truck loads, 6s. 9d., slaked; do., 5s.; blue, 3s. 6d.; plaster lime, 4s.; bricks at kiln, stock, 36s. to 42s.; wire cuts, 40s. to 50s. pressed, 65s. per 1,000 road transport now normal; salt and white glazed bricks, £27 10s per 1,000; tiles, roofing, £17½ square; glazed tiles, 10s. 6d. to 17s. 6d. yard; paving cement tiles, 8s. 6d. yard laid; terra cotta tiles, £15 per 1,000; reinforced concrete columns, 6 ft. plain, 22s. 6d., fluted, 24s.; fireclay bricks, £9s. good average, per 1,000; clay chimney pots, 80s. per doz.; fireclay, 37s. 6d. ton on rail.

Oils, paints, lead, oxides, glass: Linseed, raw, 30s. boiled, 31s. 6d. per 5-gall.; white lead, 72s. 6d. to 75s. per 100 lbs.; turpentine, 54s. 2/4 gallons.; coal tar, imported, 10s. to 11s. per 5 gallons.; oxide in oil, 32s. 6d. to 37s. 6d. per 100 lbs.; dry oxide, 21s. to 22s. 6d.; S.A. crude oxide, 12s. 6d.; linseed oil putty, 4s. 6d. per 12½lb.; bladders; 30s. casks of 100 lbs.; grease A.F. axle, 23s. 6d. to 25s. per 100 lbs.; tallow, 9d. per lb.; White Rose paraffin, 15s. 2/5; Laurel do., 14s. 9d.; petrol, 25s. 6d. 2/4; motor oil, 6s. to 7s. 6d. per gallon; lubricating oils, 24s. per case; cylinder, 30s.; paints in tins, 10d. to 1s. per lb., according to quantity, and if ordered to be mixed, 15 per cent. on pre-war rates. British plate-glass, ½ in., 3s. 6d.; window, 16 oz., 1s. to 1s. 3d. ft.

**Chemicals:** Mercury, £18 10s. per 75lb. bottle; bichromate potash, 1s. 6d. lb.; chlorate, 2s. 6d. lb.; permanganate, 7s. 6d. lb.; alum, 9d. lb.; carbolic acid, 5s. 6d. lb.; borax, 66s. 100 lbs.; cyanide soda, 1s. 4d. lb.; hypo, 1s. lb.; acetate lead, 67s. 6d. 100lb.; litharge (assay), 75s. (commercial) 50s. 100 lbs.; zinc sheets and blocks, 1s. 3d. lb.; plumbago crucibles, 4½ per number.

**Electrical Goods:** Lamps, high volts., British, Holland & American, 16s. to 21s. wholesale, and 21s. to 27s. dozen, retail; carbon lamps, 7s. 6d. per dozen; pure rubber flex, 9d. to 1s. per yard; 3/20 coils of wire, 30s.; do., 3/22, 26s.; tubing, 12s. to 13s. 100 ft.; keyholders, 2s. 6d. each; round blocks, 3½ in., 4s. doz., local; lamp holder cord grips, 15s. doz.; switches, 5 amp., 18s. to 14s. doz.; British glass shades, 24s. to 36s. doz.; Bohemian shades finished; porcelain shackles, 14s. 6d. doz.; do., bobbins, 16s. 6d. to 18s. 100; cleats, 18s. per 100; P.O. insulators, 18s.; motors, 3 h.p., about £28 to £35, new.

## Investments Abroad.

### TREASURY WARNING.

In the House of Commons in mail week, Mr. McKenna, replying to Sir Thomas Whittaker, said:—While the Treasury has no desire to interfere with remittances abroad for the settlement of current commercial obligations, I regard it as contrary to national interest that during the war remittances should be made from this country for investment abroad in any form whatever. It is also most desirable that moneys which accrue abroad to British subjects should be brought back to this country, and that holders of foreign securities should, when practicable, realise their holdings and invest the proceeds in British securities. In particular I would point out that remittances of money to America for the purchase of American securities and re-investment in America of money available for remittance to this country is directly opposed to the objects of the Treasury's scheme for purchasing American securities. Securities purchased abroad cannot be dealt in on the Stock Exchange under the Temporary Regulations. Although these rules only apply to members of the Stock Exchange, most financial houses have throughout voluntarily observed the restriction, and I rely upon a continuance of their assistance in discouraging investments abroad.

Sir Henry Dalziel: Does abroad include the Colonies?

Mr. McKenna said it had general application except in special cases like the French loan.

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## MINING INSTITUTE.

TEACHING CENTRES: JOHANNESBURG AND WITBANK.

Prof. YATES prepares candidates for the following Government Certificates:

MINE MANAGER'S.  
MINE OVERSEER'S.

MECHANICAL ENGINEER'S.  
ELECTRICAL ENGINEER'S.

MINE SURVEYOR'S

by Class, Private Tuition and Correspondence.

The aggregate percentage passes for the combined classes is nearly 80 %

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# Engineering Notes and News.

## THE KLEINFONTEIN POWER ASSOCIATION'S PLANT.

### Detailed Description.

By GRIEKAR GRANES, M.S.A.I. of E.E.\*

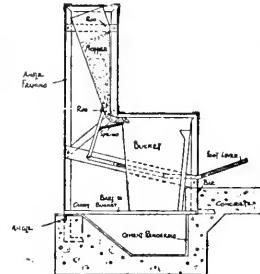
The Kleinfontein Power Association was formed by five mines connected with the Kleinfontein Group Central Administration, namely: The Apex Mines (Gold Section), The Benoni Consolidated Mines, The New Bokslung Gold Mines, The New Kleinfontein Company, and Rand Klip. Each of these has a right to a percentage of the power available in the proportion of its percentage of capital subscribed. The Benoni Municipality also takes a full supply from the Association. The site chosen for the power station is situated at the eastern end of the Kleinfontein Dam and immediately adjoining the New Kleinfontein property. This site offers the advantages of an ample water supply for condensing purposes, and good railway accommodation for coal through the K.G.C.A. Railway Syndicate lines, which run into the New Kleinfontein property. From a purely distributional point of view a site in the neighbourhood of Apex would have been more central, but no water is available in that area. The approximate distances in route miles from the power station to the main centres of secondary distribution are, roughly:—New Kleinfontein, half a mile; Benoni Consolidated, two miles; Apex, two miles; Rand Klip, nine-and-a-half miles; New Bokslung, eight miles; Benoni Municipality, half-a-mile. The supply is three-phase alternating at 25 cycles. Current is generated at a pressure of 3,100 volts, and transformed up to 20,000 for distribution by overhead lines to the consumers' sub-stations, where in turn it is transformed down to 3,000 volts and 500 volts for power purposes, and 200 volts for lighting. There is also a 3,000 volt cable supply to New Kleinfontein. Coal is brought to the station over the lines of the K.G.C.A. Railway Syndicate, and is dropped without handling into a sunk bunker having a capacity of 1,000 tons. From the bottom of this bunker one or more of its five valves feed the coal on to a belt conveyor, running in a tunnel beneath the bunkers, delivering to a bucket elevator, which raises the coal to a conveyor and distributor, running the length of the boiler house above overhead bunkers, of which there is one to each boiler. Each of these bunkers has a capacity of 60 tons. The coal then falls by gravity through shoots into the grate hoppers, and having been fed across the chain grates, the ashes are dumped into ash hoppers, situated in a tunnel beneath the boilers, from which they are periodically removed in cocomans to the ash dump by a plain motor-driven rope haulage. The coal conveyor and elevator are driven by 500 volt motors, controlled through Reyrolle switch panels situated at the end of the boiler house. The boiler house, which runs parallel with the turbine house, is built to accommodate eight boilers, of which six are at present installed, three on each side, with a central firing floor. The boilers are of the Babcock three drum land type, having a total heating surface of 7,392 square feet. Each boiler is also fitted with a Babcock super-heater of 1,760 square feet. The boilers are designed to evaporate 30,000 lbs. of water per hour from and at 100° C. to steam at 200 lbs. pressure, and super-heated to a total temperature of 299° C. Each boiler is fitted with two Babcock chain grate stokers, 8 ft. by 11 ft., giving an effective grate area of 224 square feet. The outlet gases from each boiler pass through a Green's Economiser of 240 tubes. One chimney serves each pair of boilers and a 60 h.p. fan, situated at the base of each chimney, supplies an induced draught on the "Pratt" ejector principle. The boilers are supplied by three steam driven Weir pumps with 24 in. water cylinder and 10 in. stroke. These pumps draw their water from a hotwell, 32 ft. by 12 ft. by 4 ft., into which the condensate from the turbine condensers is delivered through the filter partitions and over a weir, the quantity being measured by a Lea recorder. The make up water is also delivered into this tank through

a cold valve and pump. The main turbine house is supplied with three 2,000 k.w. Parsons' 2000 generators and condensers. The turbines are of the reaction type and run at a speed of 1,500 r.p.m. Steam is supplied at a pressure of 260 lbs. at a temperature of 285° C. Each turbine is fitted with a thermal safety valve and a steam header and fire-tube, which performs the double duty of preventing "gusts" of excessively heated steam or water from reaching the turbines. The condensers are also Parsons' made, and are fitted with their patented steam augmenters. These augmenters have proved themselves to be of especial value, where the temperature of the cooling water passing through such a wide range as is experienced really. The air pumps are of Parsons' three-stage single acting compound type, motor driven through spur gearing. The circulating water pumps are installed in a separate pump house, situated at the side of the dam, from whence they deliver through a 25 in. pipe line to the condensers. The pump house is arranged for four pumps, of which three are at present installed. They are of the centrifugal type, each having a capacity of 6,000 gallons per minute, and are direct coupled to 150 h.p. motors running at a speed of 720 r.p.m., and taking current at 3,000 volts pressure. The Parsons' generators are designed for a nominal output of 2,000 k.w. at 3,100 volts, 25 cycles and 0.8 power factor, and are star connected, the neutral being earthed. The stator cores are built up in solid castings, the armatures being wound wound. The two pole rotors are solid steel castings, machined out for the winding slots and ventilation ducts. The generators are separately excited, the motor generator being supplied for the purpose. Two of these motor generators consist of a 130 k.w. A.C. slip ring induction motor, taking current from the main 3,000 volt bus bars and driving a D.C. generator, having an output of 800 amps. at 125 volts. The third has a 36 k.w. D.C. motor, taking current at 250 volts pressure from the direct current plant of the New Kleinfontein Mine, and drives a D.C. motor having an output of 240 amps. at 125 volts. This latter plant is necessary to start up the station in the case of a total failure of the alternating supply. The main 3,000 and 20,000 volt switchgear is placed in a separate switch house, and is electrically controlled from the main operating board in the turbine house. The current for operating the switches is obtained from a battery of 70 Fuller block cells having a capacity of 150 ampere hours on a 10 hour rate. The battery is charged by a small motor generator having an output of 38.5 amperes at 130 to 175 volts. The main switchgear and control boards are of Feranti make. The main control board consists of 23 panels. Panels 1 to 4 control the primary (3,000 volts) and the secondary (20,000 volts) of the four 2,500 k.v.a. step-up transformers and are equipped with ammeters, over-load time relays and Merz Price relays. Panels 5 to 7 are spare for future generators. Panels 8 to 10 control the three 2,000 k.w. generators, and are equipped with ammeters, voltmeters, wattmeters, reverse current relays and synchronizing plugs for connection to a common synchronizer. The exciter rheostat is placed at the back of the board, and the hand wheel regulating it is front. Panel 11 carries power factor and frequency indicators, a recording voltmeter and Tirrell regulator. Panel 12 is a spare. Panel 13 controls the 300 ampere, 3,000 volt cable to the Kleinfontein Mine. Panels 14 to 16 control the two sides of the three motor driven exciters. Panels 17 and 18 control the two 3,000 volt cables feeding the pump house. Panel 19 controls the 3,000 volt supply to the auxiliary bus bars. Panels 20 and 23 control the 1 outgoing 20,000 volt overhead head lines. Panels 17 to 23 are equipped with ammeters, over-load time limit relays and wattmeters. The cables from

\*Paper read before S.A.I. of E.E.

# Improved Sanitation Underground on the Rand.

## THE O'BRIEN IMPROVED PATENT DRY EARTH CLOSET SYSTEM.



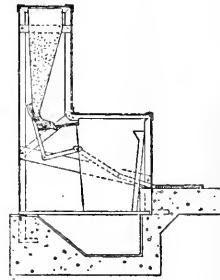
**SECTION showing Hopper and Gearing in position of rest, or immediately after foot lever has been released.**

The O'BRIEN Premier Dry Earth Closet System has undoubtedly proved itself to be the PREMIER of all dry earth systems, and only requires to be known on the mines to secure its general adoption.

**THE PRINCIPLE OF THE SYSTEM IS THE SEPARATING OF THE LIQUID FROM THE SOLID OR FECAL MATTER,** which is done by mechanism inside the pan. The Liquid is run into a chamber under or near the pan, which chamber is partly filled with a chemical absorbent preparation, and combining with the preparation thereby forms A PERFECTLY PURE, ODOURLESS SOLID, or by other means treated and allowed to flow away pure. The fecal matter in the pan is automatically covered with a chemically prepared ash, rendering it absolutely odorless, and can be hoisted to the surface and carted away in open carts during the daytime.

The system itself is far superior to any other dry earth system, and has been largely ADOPTED BY THE SOUTH AFRICAN RAILWAYS and by the NEW SOUTH WALES GOVERNMENT FOR ALL BUILDINGS where no sewerage scheme is in use, also by MANY LEADING PUBLIC GENTLEMEN OF SOUTH AFRICA. In simplicity, cleanliness, and convenience it is far ahead of present practice.

Mr. DITCHFIELD will be happy to enter into Special Arrangements with Mines, Municipal and other Public Bodies, and, on application, will furnish estimates, and, if required, designs for the installation and maintenance of the system.



**SECTION showing Hopper and Gearing in position while in use.**

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the generators are taken direct to the oil switches, situated on the 1st floor of the switch house. The contacts of each phase of the switches being enclosed in a separate oil tank, the operating mechanism being situated directly over the three tanks. The switch mechanism is operated by two solenoids, one of which closes the switch by raising the contacts, which are then held in position by a mechanical catch. The other opens the switch by striking the catch. Gear is also provided for operating the switches by hand. From the switch the connections are of copper rod carried on or through porcelain insulators to links which are situated immediately under and connected to the 3,000 volt bus bars on the 2nd floor. The 3,000 volt bus bars are arranged in a ring, the three phases being one above the other and divided from each other by concrete slabs. Each connection to the bars is divided from the next by brick partitions. Links with spring catches are inserted in the bars between each connection, so that the bars can be split at any point or any connection can be isolated. The supply to each step-up transformer passes from the bars through links to a 3,000 volt switch controlling the primary side of the transformer, and from the secondary side of the transformer through a 20,000 volt switch, and links to the 20,000 volt bus bars. The 20,000 volt bus bars are solid and are neither ringed or duplicated. They are protected from surges by aluminum arresters. From the 20,000 volt bus bars, current is taken to the overhead lines through 20,000 volt switches, links, choke coils and links. The connections from the latter to the outgoing lines being made in a V. Each of the outgoing lines is protected with a set of aluminum arrestors situated on the first floor. The connections from the arrestors to the outgoing lines are provided with links, and are free from bends until after passing the point of contact with the connections from the feeder switches. The

four outgoing circuits pass out of the building through glass plates, which are protected from direct contact with rain by a lean-to roof. The lines run from the building to pin insulators on a girder framework, where their direction is reversed in a sharp V to the run of the pole lines. Two lines of poles are in use, each carrying two circuits, and each circuit is protected by overhead steel ground wires. With the exception of the circulating water pumps, which take a 3,000 volt supply direct from the bus bars, the station auxiliaries are operated at 500 volts pressure. Current is taken from the 3,000 volt bus bars through links, and switches to an auxiliary 3,000 volt bar from which current is taken through hand operated switches to the primary sides of two 300 K.V.A. step down transformers. Current is taken from the secondaries of these transformers to the 500 volt auxiliary bus bars. The auxiliary switchboard is situated on the turbine house floor level immediately below the platform of the main control board. From this board individual motors and lighting transformers are operated, and cables are also led to groups of Reyrolle panels and individual switches for the air pumps and boiler house supply. For lighting, current is transformed down to 250 volts, and a throwover switch gives an emergency D.C. supply from the Kleinfontein Mine. The plant was put into operation in May, 1911. Since that time it has given practically no trouble and has proved very easy to handle. The writer has only had personal experience of the plant for the last two years, but he believes he is correct in saying that on only five occasions has the supply been seriously interfered with, and only for a few minutes on those occasions. At the end of four and a half years the turbines continue to give slightly better results than the makers' guaranteed figures. The foregoing very rough description of the plant is given in the hope that it may be of some small service to those members of the Institute who will be shortly visiting the station.

## The Week's Meetings.

### TWEEOFONTEIN COLLIERY.

The ninth ordinary general meeting of the shareholders of Tweefontein Colliery, Ltd., was held on March 27, at the offices of the company, Egypt House, 36, New Broad Street, E.C., Lord Oranmore and Browne (the chairman) presiding. Mr. H. B. Browne (representing the secretaries, Henderson's Transvaal Estates, Ltd.) having read the notice convening the meeting and the auditor's report,

The Chairman said:—Gentlemen.—I presume that you will take the report as read. The authorised and issued capital of the company remain the same as last year. I am glad to say calls outstanding are reduced to £50 12s. 6d.; but, so long as they remain unpaid, dividend does not accrue on the amount in question. Sum dry creditors are practically the same as last year, the principal items being income-tax—to which I shall refer later on—and dividends due to shareholders at the close of the accounts and since paid. Profit account is practically the same as last year, the amount written off as depreciation being counterbalanced by capital expenditure during the year, which amounted to £7,600, the principal expenditure being in respect of tramway, trucks, and buildings. Stores are slightly higher; but we are assured that they represent the value appearing in the books. Sundry debtors are slightly less, and nearly £10,000 represents coal sold but not paid for. Cash in London and Johannesburg is slightly less at £10,015 7s. 6d.; but as against this our investments in War Loan and Treasury bills represent the substantial sum of £28,810 12s. 4d. Turning to the profit and loss account, London expenditure is increased by nearly £1,000. This is attributable to income tax, which is £1,171 more than last year. Depreciation is written off on the same basis as last year. The profit on coal winning and dividends from Premier Coal, Ltd., show an increase of £2,602. Rents are up £338 and interest £143. The total increase on the credit side of the balance-sheet, as compared with last year, amounted to £3,098, which result, we trust, you will regard as satisfactory considering the present unsettled times.

#### THE DIVIDENDS.

To the balance of £22,939 11s. 4d. there falls to be added the sum of £14,034 2s. 2d. brought forward from last year, making a total of £36,973 13s. 6d. Out of this we have already paid you an interim dividend of 6 per cent. on the ordinary shares, and the cumulative dividend of 6 per cent. on the cumulative preference and participating shares, absorbing £7,996 8s. 3d., and in our report we recommend the payment of a final dividend at the rate of 19 per cent. on the ordinary shares, making a total dividend of 25 per cent., and a further dividend at the rate of 4 per cent. on the cumulative preference and participating shares, making the total dividend on these shares 10 per cent., the maximum to which they are entitled. We are glad again to be able to maintain the dividend on the ordinary shares at the same rate as for the years 1913 and 1914, in spite of the abnormal conditions which exist owing to the war. After payment of these final dividends a balance of £14,681 1s. 6d. will remain, and be carried forward to the current year's account. The coal sold during 1915 was 386,738 tons, as against 313,752 tons, an increase of 12.5 per cent., and there is little doubt that the increase would have been considerably greater had it not been for the serious shortage of railway trucks, owing to which the mine was consistently precluded from working continuously at its highest, and, therefore, most economical, capacity. It is estimated that the loss of output suffered by the

collieries in the Witbank district owing to shortage of trucks during the past three years has been as follows: 1913, 295,986 tons; 1914, 119,000 tons; 1915, 502,400 tons. As we have informed you, our representatives in South Africa are co-operating with those concerned in the coal trade of that country, and representations have been made to the Government of the Union of South Africa upon the subject which will, we trust, result in some improvement in the railway facilities for conveying our product regularly from the mine to the consumers. It is obviously to the interest of the Government of South Africa, as well as that of the coal industry of the Union, to do everything possible to foster the coal trade, as the gross railage costs to Transvaal collieries amount to over £1,000,000 per annum, which represents more than the average price received by the collieries for supplying the coal.

#### BUNKERING AND EXPORT TRADE.

The falling off in the bunkering and export trade, as compared with the figures for 1913, continues. This is naturally, to some extent, due to lack of shipping; but I regret to say that in this case also the shortage of rolling stock exercises an adverse influence. I am afraid that this decrease will be accentuated in the future, as, for some at present unexplained reason, the Railway Department of the Union Government have notified the collieries of its intention to discontinue the rebate of 1s. per ton which has been granted in the past on coal for bunkering and export purposes, and which is an absolute necessity if South African coal is to compete in the Overseas coal markets. This matter is receiving the attention of the colliery authorities, and I trust some satisfactory arrangement will be come to with the railway authorities. The Transvaal Coal Owners' Association has from time to time incurred heavy expenditure in order to open up trade with India and Egypt. The prospects of extending this trade were very encouraging and it will, to my mind, be most unfortunate if the action of the Government results in the restriction of the development of the collieries of South Africa in this direction. There is no doubt that present conditions afford every opportunity for expansion in the trade of collieries situated outside the United Kingdom, and it is undesirable that any policy should be pursued which might place obstacles in the way of development of an industry which is only second in importance to that of the great gold mines of the Transvaal.

#### TAXATION.

Before concluding my remarks, I must draw your attention to the very heavy taxation to which we are now subject. In addition to the 3s. in the £ on the dividends you receive, which I am sure you will all pay willingly as a contribution to the expenses of the war, income tax is levied on the company in South Africa. The sum paid there in 1915 amounted to £2,481 5s. 9d., while the English income-tax was £2,092 7s. 9d. In addition, the company is liable to excess profits duty both for the years 1914 and 1915. The amount payable has not yet been arrived at; but as we pointed out in the report, the balance brought forward from 1915 will be subject to provision for this duty. Our thanks are again due to one manager (Mr. Simon), our representatives in Johannesburg, and our staff at the mine for the satisfactory results attained. I now beg to move: "That the report and accounts for the year ended December 31, 1915, be, and they are hereby, received and adopted."

Mr. W. E. Lawson Johnston seconded the resolution.

The Chairman stated that a letter had

been received from him suggesting that the company should build up a reserve fund. He referred to the matter again. He wished to point out that the company had already established a depreciation fund which was about one-third written off from the amount stated in the report of development of mines. In addition to this he desired to open the question of working-class protection, in which the miners of Transvaal, which formed an important factor in the development progress.

The resolution was carried, the meeting adjourned.

The Chairman next moved adoption of the dividend, which was intended in the report, the same to be paid on March 31 to the shareholders registered in the books of the company at that date.

Mr. J. Kessler seconded the motion, which was unanimously agreed to.

The Chairman then proposed the re-election of Mr. W. C. L. Lawson Johnston as retiring director.

This was seconded by Mr. Kessler and carried unanimously.

Mr. J. Durie Patell was appointed auditor of the company for the ensuing year, on the motion of Mr. W. L. Castle-Jen, seconded by Mr. F. R. Cunningham.

The proceedings then terminated.

### MINERS' PHTHISIS SANATORIUM.

The sixth annual meeting of this Institution was held in the Transvaal Chamber of Mines on Wednesday, 19th April, 1916, at 3.30 p.m. There were present: Mr. Julius Jeppé (chairman), Dr. J. M. Mehliss, Dr. S. V. van Niekerk, Dr. G. Wallace (acting Medical Superintendent), and Mr. W. Gemmill (secretary). The Chairman, in moving the adoption of the report and accounts for the year ended 31st December, 1915, said: "It will be observed that there is a reduction of £608 in the maintenance expenditure, and that the average maintenance cost per patient per day was 9s. 5d. in 1915, as compared with 10s. 3d. in 1914. The number of patients in the Institution was 464 in 1915, as compared with 551 in 1914, and 414 in 1913. The number of deaths during the year was 11, as compared with 36 in 1914 and 18 in 1913. 83 patients were discharged, of whom 53 were improved and 30 not improved. It will be observed that the Medical Superintendent in his report states that 85 per cent. of the deaths of the year are due to a combination of silicosis and tuberculosis. The importance of a clear understanding of the relation between the two diseases has been long recognised, and during the year a very valuable report on the subject was submitted to the board by your Medical Superintendent, following upon which a recommendation was made to the Government and the Chamber of Mines to the effect that separate institutions be maintained, one for men affected with silicosis only and the other for men with silicosis plus tuberculosis. It is unlikely that a decision on the recommendation will be arrived at until the Select Committee on Miners' Phthisis at present sitting has reported. The Select Committee paid a visit to the Sanatorium in January and was, I think, favourably impressed with the Institution and its surroundings. The patients continue to take considerable interest in the recreation and occupations provided for them at the Sanatorium; indeed, a considerable extension of the ground cultivated as gardens by the patients took place during the year. The new bowling green is now al-

most in playable condition, and before the end of the year should be actually in commission. The excellence of the provision made for patients at the Sanatorium is evidenced by the very few complaints that are made by the patients. The nursing staff is most efficient and has been maintained at almost full strength in spite of the scarcity of nurses occasioned by the war. In December the Johannesburg Hospital Board applied for a loan of Dr. Aitken, your medical Superintendent

ent, for three months to take the place of Dr. Mackenzie, the Medical Superintendent of the Johannesburg Hospital, who was proceeding on active service. The Board had pleasure in agreeing to this request, and during Dr. Aitken's absence his duties have been ably carried out by Dr. Wallace, the Medical Officer of the British South African Explosives Company, Ltd., Modderfontein, and your thanks are due both to Dr. Wallace and the Explosives Company for their kindness in meeting us in the matter. I would also

like to express our appreciation of the valuable services rendered by our secretary, Mr. W. Gemmill, and for the keen interest he continues to take in the welfare of the Institution. I have now pleasure in moving the adoption of the directors' report, the income and expenditure account and the balance sheet for the year ended 31st December, 1915.

The report and accounts were adopted, and Messrs. Douglas, Low and Company were re-elected auditors for the current year.

### South African Gold Trust.

The report of the South African Gold Trust, Ltd., for the year 1915 states that the directors, after carefully considering the company's liquid cash position in conjunction with the prevailing market conditions and prospects, decided to redeem, and have redeemed, the whole of the Debentures outstanding, amounting in all to £70,000, at £102 10s. The realised net profits on the year's operations, almost entirely derived from dividends on investments and interest on loans, after deducting Debenture interest and all charges, amount to £81,599, from which the dividend on the Preference shares and French Government tax have been deducted, leaving £51,108, which, with the amount brought forward—namely, £10,499—makes £61,607. As foreshadowed in the chairman's address at the last annual meeting, the directors have considered it desirable to alter the system of presenting the accounts in order that the appreciation in the value of its investments may be taken into account against depreciation, which has not been the practice under the system hitherto adopted. Under the new system the present appreciation more than counterbalances depreciation, but as this appreciation, though based on a conservative valuation, is partly derived from unquoted securities, the directors do not feel justified in recommending the distribution of a dividend. The Consolidated Gold Fields of South Africa, Ltd., and the directors of this company are entitled to their percentage on the declared profits, but, in view of the fact that shareholders are not receiving a dividend, both that company and the directors agree to waive their rights. The investments stand in the books at cost or under. A schedule of the principal holdings is appended:—

*Abbontiakoon Mines, 10s. shares	22,104	
African Banking Corp., £10 shares, £5 paid	874	
*African City Properties Trust Ord.	17,925	
*African Land and Invest. 5 p.c. Debs.	£6,400	
Anglo-Columbian Development, shares	27,427	
American Trona Corp. 7 p.c. \$100 Pref.	£72,100	
Do. \$100 Com.	£72,100	
Bell Reef Development, shares	7,734	
Brazil Government 5 p.c. Loan 1913	£9,400	
*British Burmah Petroleum 6 p.c. Debs.	£30,398	
British Cyanides 6 p.c. Pref.	18,749	
Cam and Motor Gold, shares	11,604	
Central Petroleum 5 p.c. \$100 Pref.	£38,102	
Cinnamon Bippo, shares	5,051	
*Cons. Gold Fields of S. Africa Ord.	17,337	
* Do. 6 p.c. 1st Pref.	68,107	
* Do. 6 p.c. 2nd Pref.	£17,400	
Electric Light and Power of Cochabamba 6 p.c. Loan	18,837	
Falcon Mines, shares	£12,270	
* Do. 6 p.c. Debs.	9,687	
Fanti Consolidated, 10s. shares	£2,080	
Feldal Copper and Sulphur 6 p.c. 1st Debs.	£4,290	
* Do. 6 p.c. 2nd Debs.	4,750	
Foreign Mines Development, shares		

\* Paying dividend or interest.

In addition to the above, the company holds sundry South African and miscellaneous securities, of which £4,770 is the value of the quoted portion, the remainder representing securities having no market quotation. The company also holds a small interest in two unquoted South African properties.

### Coal in the Aberdeen District.

In the House of Assembly last week the Minister of Mines, replying to Mr. Enslin, said he was aware of an occurrence of coal in the Camdeboo Mountains, in the district of Aberdeen, and from reports made in 1879 (Blue-book G.37, '79), in 1881 (G.71, '81), and in 1882 (G.35, '82), it would be seen that the various geologists who had reported on the occurrence were in agreement that the coal occurred in an abnormal and unique manner in faults and fissures, and behaved so irregularly that no definite seam could be located.

### NOTICE: To Mine Managers & Others

M. CHADWICK & CO., Scrap Metal and Rubber Buyers, are prepared to pay highest prices for Copper, Brass, Lead, Zinc, Cast Iron, or metal of any description. Lead, Zinc, White Metal in Ingots always on hand for sale at lowest prices. Write, send, or Telephone 5072, Box 2700, 55, Sauer Street. Prompt attention guaranteed. Distance no object.

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# Rand Mines, Limited.

(Incorporated in the Transvaal.)

## REPORT OF THE DIRECTORS

For the Year ended 31st December, 1915.

To be submitted at the Twenty-first Ordinary General Meeting of Shareholders, convened for Wednesday, 21st June, 1916, at 11 a.m., in the Board Room, The Corner House, Johannesburg.

To the Shareholders,

### RAND MINES, LIMITED.

Gentlemen,—Your Directors beg to submit their Twenty-first Annual Report and Audited Accounts for the year ended 31st December, 1915.

#### ACCOUNTS.

The profit for the year amounted to £886,355 11s. 9d. When compared with that for the previous year a decrease of £279,895 4s. 7d. is shown, which is chiefly accounted for by a falling off in the amount received from dividends on shareholdings amounting to £262,986 12s. 9d. Reduced dividends were declared by the Crown Mines, Ltd., Nourse Mines, Ltd., The Village Main Reef G.M. Co., Ltd., and Ferreira Deep, Ltd. A satisfactory increase is shown in the dividends declared by the Modderfontein B. Gold Mines, Ltd., and the City Deep, Ltd. The previous year's receipts included bonus distributions by the Ferreira Deep, Ltd., and Robinson G.M. Co., Ltd.

The revenue derived from Reservoirs, Interest and Exchange and Sundry Revenue shows a decrease of £7,255 18s. 10d., and Share Realisation Account shows a decrease of £10,344 16s. 0d. Against these decreases, administration and other expenditure show a reduction of £692 3s. 0d.

The balance of £339,102 14s. 8d. unappropriated at the commencement of the year, together with the above profit of £886,355 11s. 9d., and £53 11s. 4d. in respect of forfeited dividends, making a total of £1,225,491 17s. 9d., has been dealt with as follows:—

Net expenditure on Investments, etc. ....	£54,804 15 11
Dividends Nos. 24 and 25—160 per cent. ....	850,393 0 0
	£905,202 15 11
Balance represented by Debentures and Union of South Africa Stock, Cash and Cash Assets, less Liabilities ....	320,289 1 10
	£1,225,491 17 9d.

A sum of £7,279 8s. 0d. has been written off Debentures and Union of South Africa Stock in order to reduce the book value to the market price at the end of the year.

This Company administers the importation and purchase in bulk of certain mining supplies on behalf of the Companies of the Central Mining Rand Mines Group during the period of the war, and, in order to facilitate the allocation and accounting work in connection therewith, the cost of the supplies is in the first place paid by this Company. The total amount of the payments outstanding at the end of the year was £48,419 17s. 3d., which, however, has since been recovered from the Companies participating.

#### INVESTMENTS.

##### Claims and Water-rights.

An expenditure of £4,169 8s. 0d. was incurred during the year on the maintenance of title (claim licences, etc.) to claims on farms "Elandsfontein" Nos. 6, 11 and 26, and "D'rifontein" No. 12, whilst an amount of £7,040 16s. 3d. was expended on the acquisition of a half interest in 862.38 claims on the farm "Vogelstruisbult" No. 36, situate on the Far Eastern Rand, and immediately south of the farm "Daggafontein" No. 25.

The claims and water-rights now held are detailed in the Balance Sheet.

##### Freehold Farm Properties.

No change has taken place in the area of your freehold farm properties during the year, the particulars of which appear in the Balance Sheet annexed.

##### Freehold and Leasehold House Properties.

Two house properties have been disposed of during the year practically at book figures. The remaining properties have been written down to the estimated market values as at the end of the year.

#### Shares.

The following shares have been purchased during the year—  
180 £1 shares in the Jupiter Gold Mining Co., Ltd.  
2,600 10s. shares in the Crown Mines, Ltd.  
5,000 £1 shares in the Modderfontein Deep Levels, Ltd.  
15,000 £1 shares in the Geduld Proprietary Mines, Ltd.

The sales were as follows:

1,800 £1 shares in the Modderfontein B. Gold Mines, Ltd.  
650 £4 shares in the New Modderfontein G.M. Co., Ltd.

Particulars of the shares held by your Company will be found in the Balance Sheet.

The South Deep, Ltd., and Booyse's Estate, Ltd., have been placed in voluntary liquidation, and this Company's shareholdings will shortly be exchanged for 93,204 fully paid "B" shares of £1 each in the Robinson Deep, Ltd.

The following is a brief review of the results achieved by the Gold Mining Companies in which your Company is interested.

Detailed reports, and accounts for the financial year, of the Companies of the Central Mining Rand Mines Group, will be annexed when circulating the report of the proceedings at the forthcoming meeting.

#### Bantjes Consolidated Mines, Ltd.

The net profit for the year, which amounted to £9,922, was adversely affected by a collapse in the main shaft in December, 1914, where hoisting was not resumed until the end of February, 1915. It has been decided to concentrate development work on the Leader instead of the South Reef. Satisfactory values are now being obtained in certain sections and the outlook is much improved. The net cash on hand at the end of the year amounted to £26,477, exclusive of a sum of £15,084 provided for development work.

The ore reserve at 643,000 tons shows a decrease of 182,300 tons, the value being the same as in the previous year, namely, 6.1 dwt. No dividend was declared by this Company during the year.

#### City Deep, Ltd.

The report on the year's operations of this Company is very satisfactory, large increases having been made in tonnage treated, profit earned, and dividends declared. The net profit amounted to £624,632, which is £216,915 higher than for 1914, and the dividends rose from 233 per cent. to 333 per cent.; the net cash carried forward was £136,455.

The ore reserve was 2,976,800 tons, of a value of 9.5 dwt., an increase of 466,000 tons, and a decrease of 0.2 dwt., respectively.

A Butters' Filter Plant capable of treating 45,000 tons of slimes per month is on order, and when erected will result in an improvement in metallurgical efficiency and a substantial increase in the reduction plant capacity, at a relatively small cost.

The ventilating shaft has been completed and equipped, the improvement in ventilation of the underground workings being most satisfactory.

#### Crown Mines, Ltd.

The tonnage crushed was higher than the previous year, but owing to increased working costs the net profit showed a slight decrease. Dividends declared were 20 per cent. less than in 1914, but the amount of cash and cash assets at the end of the year showed an increase of £126,498, which with the provision for the special war levy accounts approximately for the difference in the amounts of dividends declared.

The ore reserve was 9,938,000 tons of a value of 6.25 dwt., which is 84,000 tons less than the previous year; but higher in value to the extent of 0.25 dwt. The net cash liability, exclusive of outstanding Debentures, amounted to £40,484.

## Rand Mines, Ltd.—continued.

## Durban Roodepoort Deep, Ltd.

The net profit amounted to £48,198, which is an increase over 1914; the net cash on hand amounted to £15,376; the ore reserve was 1,290,000 tons of a value of 6.5 dwts.

Two dividends, each of  $\frac{3}{4}$  per cent., were declared.

## East Rand Proprietary Mines, Ltd.

The profit for the year on working account was £173,254 less than that earned during the previous twelve months.

The ore reserve amounted to 4,800,000 tons of a value of 6.3 dwts. per ton; both the quantity and value are lower by 600,000 tons, and 0.3 dwts., respectively; dividends amounted to  $1\frac{1}{4}$  per cent.

## Ferraria Deep, Ltd.

The net profit for the year ended 30th September, 1915, amounted to £363,582. This was considerably lower than the previous year, owing to two serious collapses in No. 2 Incline Shaft, which occurred in December, 1914, and April, 1915. On each occasion the collapse was coincident with a heavy earth tremor. The condition of the Incline Shaft was found to be so bad after the second collapse that it was decided to reorganise the hoisting arrangements in this shaft. The cost, which will amount to approximately £42,312, is being charged against Working Costs, as the work proceeds. The net cash on hand at the end of September amounted to £42,065.

The ore reserve was 1,854,100 tons of a value of 8.3 dwts., which is practically the same as the previous year.

Two dividends of 25 per cent. and  $1\frac{1}{2}$  per cent., and a bonus of 25 per cent., were declared.

## Geduld Proprietary Mines, Ltd.

The net profit for the year amounted to £151,509, and two dividends, each of 5 per cent., were declared. The ore reserve, which showed an increase of 200,000 tons and an increase in value of 0.6 dwt. per ton, at the end of the year was 2,100,000 tons of an average value of 7.7 dwts. per ton.

An increase in the reduction plant to a capacity of 40,000 tons per month has been taken in hand, and under normal circumstances would be brought into commission in September next, but delay of a few months may be expected on account of present circumstances.

## Geldenhuys Deep, Ltd.

The net profit earned by this Company was slightly lower than 1914, but the dividends declared, amounting to 20 per cent., were  $1\frac{1}{2}$  per cent. higher than 1914. The net cash on hand at the close of the year was £102,212.

The ore reserve was 1,826,800 tons, which is 213,800 tons in excess of the previous year, but the value at 6.1 dwts. is 0.3 dwt. lower.

## Jupiter Gold Mining Co., Ltd.

In May, 1915, it was decided to re-open the mine.

During the period from 1st May to 31st August, 1915, the plant and equipment were overhauled and the underground workings were brought into a state of good order preparatory to the commencement of crushing operations.

Crushing operations commenced on the 1st September, 1915, and resulted in losses for the first two months, owing to the usual absorption of gold in the plant. As from November, 1915, however (two months after the date crushing operations commenced), profitable returns were made.

## Main Reef West, Ltd.

The profit for the year ending 30th June, 1915, was £50,876, which is a decrease of £5,765. The payable ore reserve at 30th June, 1915, amounted to 416,230 tons with a value of 5.87 dwts. No dividend was declared, and an arrangement has been made with the holders of Debentures to suspend for three years the provisions of the Debenture Trust Deed, which provide for the redemption of the Debentures annually.

## Modderfontein "B" Gold Mines, Ltd.

The year's results were very satisfactory, as the working profit exceeded that of 1914 by £163,575. Dividends were declared amounting to  $6\frac{1}{2}$  per cent., and at the end of the year the Company had a net cash reserve of £190,991.

The payable ore reserve was 2,790,740 tons, of an average value of 8.75 dwts. per ton. An additional tube mill commenced work in September, bringing the capacity of the reduction plant up to 45,000 tons per month.

## Modderfontein Deep Levels, Ltd.

The net profit for the year amounted to £283,303, and Dividends Nos. 1 and 2, amounting to 35 per cent., were declared. The ore reserve at the end of the year was 2,670,000 tons of a value of 8.3 dwts. per ton. The reduction plant is being increased to a capacity of 40,000 tons per month, and is expected to be in operation about the middle of 1916.

## New Modderfontein Gold Mining Co., Ltd.

For the year ended 30th June, 1915, this Company attained records in respect of the tonnage crushed, profit earned, and dividends declared—the latter amounting to  $3\frac{1}{4}$  per cent. Net cash to the amount of £236,872 was carried forward, and will be applied towards defraying the cost of the additional plant, now on order, which when erected will bring the crushing capacity to 92,500 tons per month. It is hoped that this will be in commission at the end of 1917.

The ore reserve amounted to 6,010,800 tons, of a value of 8.15 dwts. per ton.

A dividend of  $16\frac{1}{4}$  per cent. was declared for the half year ending 31st December, 1915.

The results obtained by this Company since the close of its financial year are satisfactory.

## Nourse Mines, Ltd.

The net profit obtained for the year ended 30th June, 1915, was £9,253 lower, and the dividends declared 5 per cent. less than the previous year; the net cash on hand at the end of June last amounted to £65,320.

The ore reserve of 2,952,400 tons at a value of 5.7 dwts. showed an increase of 478,700 tons, but a decrease in value of 0.7 dwt.

## Robinson Gold Mining Co., Ltd.

The working profit earned by this Company was £490,451. Dividends aggregating 14 per cent. were declared and at the end of the year the Company had a net cash and investments to the amount of £97,009.

## Rose Deep, Ltd.

The net profit of £274,942 for the year shows a slight increase, but the rate of dividend declared,  $32\frac{1}{2}$  per cent., was  $2\frac{1}{2}$  per cent. lower than 1914; the net cash on hand at the close of the year amounted to £37,209.

The ore reserve amounted to 3,605,390 tons, of an average value of 5.2 dwts. This shows a decrease of 351,710 tons, and 0.3 dwt., respectively.

A comprehensive scheme for sand-filling worked-out portions of the mine has been inaugurated.

## The Village Main Reef Gold Mining Co., Ltd.

At the end of September, a movement of strata took place, which resulted in severe damage to portions of the shaft. Hoisting from the lower levels of the mine was entirely suspended until the end of December. During the work of repair, which occupied a period of three months, mining was carried on in the upper levels on a small scale, and a loss was incurred for the last quarter of the year. One dividend of 20 per cent. was declared.

## Village Deep, Ltd.

The profit for the year was slightly lower than for 1914, but the same rate of dividend, namely,  $2\frac{1}{4}$  per cent., was declared; the net cash on hand at the close of the year amounted to £35,415.

The ore reserve was 2,631,600 tons of a value of 6.6 dwts. This is 271,800 tons lower than the previous year, the value being 0.2 dwt. per ton lower.

## Rand Mines, Ltd.—continued.

## Wolhuter Gold Mines, Ltd.

The profit for the year ended 31st October, 1915, amounted to £153,011, which was a little lower than for 1914; the dividends declared were the same as last year, namely, 12½ per cent.

The ore reserve amounted to 1,263,320 tons of an average value of 5.8 dwt.s.

## RESERVOIRS.

The supply of water has been ample, and at the 31st December, 1915, the Booysens Spruit Reservoir was full and the Natal Spruit Reservoir almost in the same satisfactory state.

The position was:—

		Maximum.	Minimum.
Height.	Gallons.	Height.	Capacity.
Natal Spruit . . . . .	43ft. 4in.	885,288,000	44ft. 0in. 920,648,000
Booysens Spruit . . . . .	30ft. 6in.	230,904,000	30ft. 6in. 240,904,000

The rainfall for the season 1914-1915 was 44.46 inches as against 28.15 inches for the season 1913-1914.

## DIVIDENDS.

You are asked to confirm the declaration by Directors during the year of Interim Dividends, Nos. 24 and 25, each of 80 per cent., which absorbed £850,398.

The amounts due to Shareholders resident in enemy territories in respect of Dividends Nos. 23 and 24 were paid over to the Bank of England for the credit of the Paymaster General, in accordance with the official direction of the Custodian in terms of the "Trading with the Enemy Amendment Act, 1914, of England. The amount so due in respect of Dividend No. 25 has been retained in South Africa pending legislation by the Government of the Union of South Africa.

## DIRECTORATE.

Mr. Raymond W. Schumacher, who has been Chairman of the Company since December, 1909, was obliged on account of ill-health to relinquish this position and proceed to Europe. As Mr. Schumacher remains a Director his valuable assistance will not be lost to the Company.

Mr. E. A. Wallers has been appointed Chairman.

Mr. Raymond W. Schumacher and Sir S. Neumann retire in terms of the Articles of Association, and are eligible for re-election.

## AUDITORS.

You are requested to determine the remuneration of the retiring Auditors, Messrs. C. L. Andersson & Co., and Messrs. Douglas, Low & Co., for the past audit, and to appoint Auditors for the ensuing year.

## GENERAL.

The results of the operations of the companies in which you are interested have been briefly referred to above, and must be considered satisfactory in view of the general increase in the cost of stores and materials, and the calls made on men for service in Europe and Africa; although the arrangements made with the Imperial Authorities for the disposal of bullion are satisfactory, there have been notable advances in the cost of insurance, transport, and realisation of the gold produced, and it has been necessary for all Companies to lay in stocks of stores and materials much in advance of previous years.

A very ready response was given by the employees of the Central Mining Rand Mines Group to the call for volunteers for active service in Europe and Africa. A total of 1,173 men had joined the forces at the end of the year, and allowances have been made, varying from quarter pay for single men without dependents and half-pay for married men, or single men with dependents.

A special war levy of £500,000 was made by the Government on the Mining Industry, payable by the Companies pro rata to the tax paid by them on profits. The estimated amount of this additional impost has been provided for in the Companies' Accounts.

Probably for the first time in the history of the Rand the requirements of the mining companies in respect of native labour have been fully met. A plethora, following upon years of shortage, has been the cause of some disorganisation, and, in some instances, has had the effect of increasing working costs, but advantage has been taken of this position to push development operations as much as possible and to do other essential mining operations as much as possible and to do other work which can only be carried out when the supply of native labour is in excess of the requirements for essential mining operations.

The health and safety of employees still has constant attention, and no efforts have been spared to reduce the rate of mortality to a minimum. The results in this respect still continue satisfactory.

E. A. WALLERS, Chairman and  
Managing Director

W. H. DAWE,  
F. RALEIGH,  
H. A. ROGERS,  
E. CHAPPELL,  
H. C. BOYD,  
E. RENAUD,  
F. C. DUMAT,

Directors

S. C. STELL, Secretary.

Rand Mines, Ltd.—continued.

Dr.	BALANCE SHEET, 31st DECEMBER, 1915.	Cr.
<b>CAPITAL AND LIABILITIES.</b>		
To Capital Account—		
Authorised—2,200,000 shares of 5s. each ... ... ... £500,000 0 0		
Less—    74,000 shares of 5s. each in re- serve ... ... 18,501 5 0		
Issued—    2,125,995 shares of 5s. each ... ... £531,498 15 0		
,, Share Premium Account—		
As per Balance Sheet, 31st Decem- ber, 1914 ... ... ... 170,777 0 0		
,, Funds Transferred from Appropriation Account—		
For expenditure on investments in excess of working capital pro- vided ... ... ... 3,654,133 12 11		
	3,824,910 12 11	
	4,356,409 7 11	
,, Sundry Creditors—		
Unpaid and unclaimed dividends... 567,034 4 7		
Sundries ... ... ... 45,661 17 3		
	612,696 1 10	
,, Appropriation Account—		
Balance unappropriated ... ... 320,289 1 10		
Contingent Liabilities—		
On account of shares subscribed for in other companies, viz.:—		
Co-operative Exchange Yard, Ltd.—		
£64 per share uncalled on 5 shares ... ... ... ... £320 0 0		
Rand Mutual Assurance Co., Ltd.—		
£4 per share uncalled on 5 shares ... ... ... ... 20 0 0		
	£340 0 0	
For contracts open for mining supplies on account of sundry companies.		
<b>PROPERTY AND ASSETS.</b>		
By Claims and Water-rights, at cost—		
1,242,6370 Mining Claims on Farms "Elandsfontein" Nos. 6 and 11, and "Driefontein" No. 12 ... ... ... ...		
9,1939 Mining Claims on Farm "Elandsfontein" No. 26 ...		
Half-share in 362,3800 Mining Claims on Farm "Vogelstruis- built" No. 36 ... ... ...		
10 Water-rights on Farms "Elands- fontein" Nos. 6 and 26 and "Turffontein" No. 19 ...		
,, Freehold Farm Properties—		
"Moofontein" No. 14," freehold, in extent 612 morgen 137 roods		
"Langhaete No. 13," freehold, in extent 236 morgen 311 roods 89 feet ... ... ... ...		
"Driefontein" No. 12," freehold, in extent 225 morgen 213 roods ...		
,, Freehold and Leasehold House Prop- erties ... ... ... ...		
,, Reservoirs and Pumping Plants—		
at cost—		
Natal Spruit Reser- voir and pumping plant ... ... ... ... £121,016 0 5		
Booysens Spruit Reser- voir and pumping plant ... ... ... ... 52,883 8 11		
Canada Dam tempor- ary station and plant ... ... ... ... 8,425 12 2		
Florida - D u r b a n Roodepoort Deep temporary pumping station and plant 9,064 1 6		
	191,389 3 0	
	£265,064 1 8	
,, Shares—		
81,444 Bantjes Con. Mines, Ltd. £1		
5,222 Booysens Estate, Ltd. (in Liquidation). See Direc- tors' Report £1		
205,437 City Deep, Ltd. £1		
852,877 Crown Mines, Ltd. 10s.		
127,017 Durban Roodepoort Deep, Ltd. £1		
55,198 East Rand Proprietary Mines, Ltd. £1		
393,468 Ferreira Deep, Ltd. 15,000 Geduld Proprietary Mines, Ltd. £1		
282,593 Geldenhuys Deep, Ltd. £1		
142,875 General Estates, Ltd. £1		
125,273 Jupiter G.M. Co., Ltd. £1		
39,382 Main Reef West, Ltd. £1		
62,723 Modderfontein B. Gold Mines, Ltd. £1		
5,000 M o d d e r fontein Deep Levels, Ltd. £1		
33,020 New Modderfontein G.M. Co., Ltd. £4		
391,233 Nourse Mines, Ltd. £1		
5,758 Pretoria Portland Cement Co., Ltd. £1		
29,275 Robinson G.M. Co., Ltd. £5		
269,324 Rose Deep, Ltd. £1		
22,463 South Deeps, Ltd. (in Liquidation). See Direc- tors' Report £1		
45,347 The Village Main Reef G.M. Co., Ltd. £1		
19,520 Turffontein Estate, Ltd. £1		
12,000 Victoria Falls and Trans- vaal Power Co., Ltd. (6 per cent. cumulative pre- ference shares) £1		
117,340 Village Deep, Ltd. £1		
23,720 Wollnutter Gold Mines, Ltd. £1		
Sundry shares ... ... ... ... 108,963 17 5		
	4,091,345 6 3	
Carried forward	£5,289,394 11 7	
Carried forward	£4,356,409 7 11	

Rand Mines, Ltd.—continued.

Dr.	BALANCE SHEET, 31st DECEMBER, 1915.	Cr.
Brought forward . . . . .	£5,289,394 11 7	Brought forward . . . . .
By Machinery, Plant, Stores, etc. . . . .	£1,517 9	
.. Vehicles . . . . .	3,447 13	
.. Furniture, etc . . . . .	3,750 9	
.. Sundry Debtors . . . . .	<u>£6,715 2 3</u>	
Dividends to be received on Share holdings . . . . .	333,271 12 9	
Amounts owing by Sundry Companies — On Current Accounts, £20,817 3s.; on Advance Accounts, £36,400; . . . . .	57,217 3 0	
Payments on account of mining supplies in stock and in transit for account of sundry companies . . . . .	48,419 17 3	
Current Accounts and Payments in Advance . . . . .	33,173 19 7	
	<u>472,062 12 7</u>	
	480,797 15 4	
.. Deposits, Fixed and on Call, bearing interest . . . . .	270,655 15 3	
.. Debentures and Union of S.A. Stock, —		
£33,960 East Rand Proprietary Mines, Ltd., 5 per cent. Debentures, £28,017;		
£33,250 Crown Mines, Ltd., 5 per cent. Debentures, £32,036 8s. 6d.		
£100,000 Union of South Africa 4 per cent. stock,		
£92,000 . . . . .	152,053 8 0	
.. Cash at Bankers and in hand . . . . .	29,480 4 7	
	<u>452,187 8 4</u>	
	932,985 3 8	
	<u>£5,289,394 11 7</u>	

E. A. WALLERS, Chairman and Managing Director

S. C. STEHL, Secretary.

W. H. DAWE, Director.

## AUDITORS' REPORT.

To the Shareholders,

## RAND MINES, LIMITED.

We have audited the Balance Sheet of the Rand Mines, Ltd., dated the 31st December, 1915, above set forth, and have obtained all the information and explanations we have required. In our opinion, such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs, according to the best of our information and the explanations given us and as shown by the Books of the Company.

C. L. ANDERSSON &amp; CO.,

DOUGLAS, LOW & CO.,  
(Incorporated Accountants), Auditors

Johannesburg, 31st March, 1916.

Rand Mines, Ltd.—continued.

## Dr. PROFIT AND LOSS ACCOUNT for the Year ended 31st DECEMBER, 1915. Cr.

To Administration Expenses—		By Dividends on Shareholdings—
Salaries and rents, Johannesburg and London .....	£10,328 8 7	City Deep, Ltd. .... 33½% £69,334 19 9
Directors', Foreign Agents' and Auditors' fees .....	6,882 4 11	Crown Mines, Ltd. .... 65% 2,699 10 6
Stationery, printing, advertising, postages, and telegrams....	3,255 13 0	Durban Roodepoort D. Ltd. 7½% 9,526 5 6
Legal expenses....	149 3 6	East Rand Prop. Mines, Ltd. 11½% 6,209 15 6
Sundry donations....	6,081 6 8	Ferreira Deep, Ltd. .... 42½% 167,223 18 0
Sundry general expenses .....	2,585 14 7	Geduld Prop. Mines, Ltd. 5% 750 0 0
	£29,282 11 3	Goldenbush Deep, Ltd. .... 20% 56,518 12 0
.,. Government Taxes ..	2,664 15 4	General Estates, Ltd. .... 5% 7,143 15 0
.,. Prospecting Venture	312 18 5	Modder B. G.M., Ltd. .... 67½% 42,760 10 6
.,. Depreciation—		Modder Deep Levels, Ltd. 25% 1,250 0 0
Written off Freehold and Leasehold House Properties....	1,317 17 11	New Modder G.M. Co., Ltd. 32½% 42,958 10 0
Written off Union of South Africa 4 per cent. Stock and East Rand Proprietary Mines, Ltd., 5 per cent. Debentures ..	7,279 8 0	Ncousie Mines, Ltd. .... 10% 39,123 6 0
	8,597 5 11	Preatoria Portland Cement Co., Ltd. .... 20% 1,151 12 0
	£40,857 10 11	Robinson G.M. Co., Ltd. .... 14% 20,492 10 0
.,. Balance—		Rose Deep, Ltd. .... 32½% 87,497 16 0
Profit for the year carried to Appropriation Account .....	886,355 11 9	Turffontein Estate, Ltd. 5% 976 0 0
		The Village Main Reef G.M. Co., Ltd. .... 20% 9,069 8 0
		Victoria Falls and Transvaal Power Co., Ltd.—6 per cent. per annum for the period from 1st January, 1913, to 28th February, 1915 .....
		1,560 0 0
		Village Deep, Ltd. .... 21½% 24,934 15 0
		Wolhuter G.M., Ltd. .... 12½% 2,965 0 0
		Sundry shares .....
		100 0 0
		£868,539 3 9
		42,754 10 1
		.. Reservoirs—
		Net revenue .....
		4,980 19 8
		Interest and Exchange .....
		14,983 17 9
		Sundry Revenue .....
		22,789 12 8
		911,293 13 10
		.. Shares Realisation—
		Proceeds of shares sold less book value .....
		15,919 8 10
		£927,213 2 8

Dr.

## APPROPRIATION ACCOUNT.

Cr.

To Investment Account—		By Balance Unappropriated—
Funds appropriated for year ending 31st December, 1915.....	£54,804 15 11	As per Balance Sheet, 31st December, 1914... £339,102 14 8
.,. Dividend Account—		.,. Balance of Profit and Loss Account—
Interim Dividend No. 24 of 80 per cent., declared June 15, 1915 .....	£425,199 0 0	For the year ending 31st December, 1915... 886,355 11 9
Interim Dividend No. 25 of 80 per cent., declared December, 14, 1915 .....	425,199 0 0	.,. Forfeited Dividends—
	850,398 0 0	Dividends unclaimed for a period of five years, forfeited in terms of Clause 122 of the Articles of Association .....
	£905,202 15 11	33 11 4 •
.,. Balance Unappropriated—		
Carried to Balance Sheet....	320,289 1 10	
	£1,225,491 17 9	
		£1,225,491 17 9

S. C. STEHL, Secretary.

E. A. WALLERS, Chairman and Managing Director.

W. H. DAWE, Director.

C. L. ANDERSSON & CO.,  
DOUGLAS, LOW & CO.,  
(Incorporated Accountants), Auditors.

## **SOUTH AFRICAN RAILWAYS & HARBOURS.**

# **Excursion Facilities**

## **EASTER HOLIDAYS.**

### **¶ SPECIAL EXCURSIONS.**

#### **Natal Winter Season.**

**¶** Cheap Fares to DURBAN, etc., in operation on certain days during the months of May, June, July and August.

#### **Mid-Winter Excursions (School Vacation).**

**¶** Tickets at Single Fare for the Return Journey, during period 22nd June to 13th July. Return Journey (distance over 25 miles) to be completed by 13th August.

#### **South-Western Districts of the Cape Province.**

**¶** Cheap Fares to MOSSEL BAY, GEORGE, PORT ELIZABETH, PORT ALFRED, EAST LONDON, on certain days during period 14th to 31st July.

#### **Lourenco Marques Season.**

**¶** Reduced Fares from Stations in TRANSVAAL on 14th, 21st and 28th July.

#### **Victoria Falls Tours.**

**¶** To leave CAPE TOWN 26th June.—Fare £24.  
To leave JOHANNESBURG 8th July—Fare £15.

FOR FULL PARTICULARS SEE SEPARATE HANDBILLS.

**W. W. HOY,  
General Manager.**

Johannesburg,  
¶ March, 1916.

Fraser &  
Chalmers, Ltd.  
Corner House,  
JOHANNESBURG.

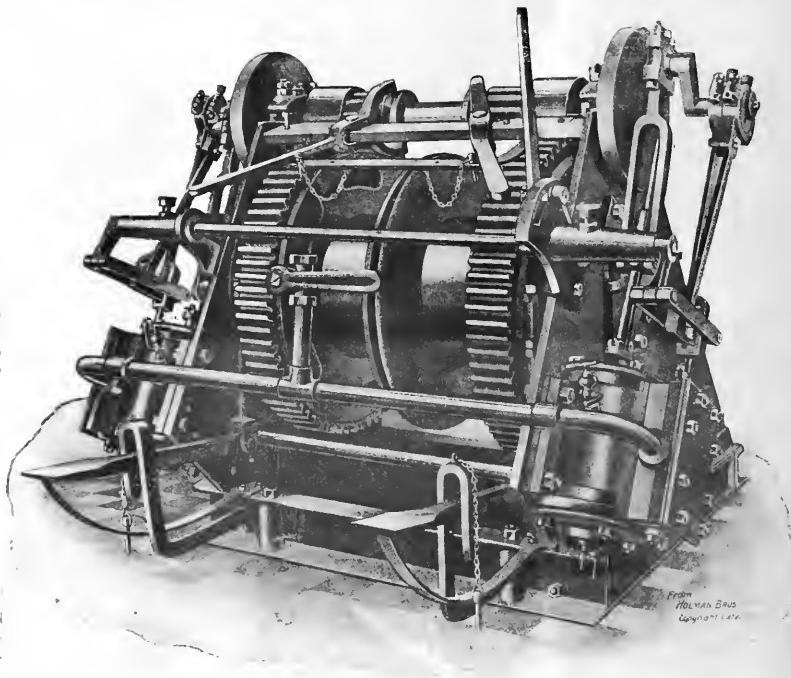
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